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REVISION OF *DRYMADUSA* STEIN
AND RELATED GENERA
(ORTHOPTERA : TETTIGONIIDAE)

T. KARABAG



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REVISION OF *DRYMADUSA* STEIN AND
RELATED GENERA
(ORTHOPTERA : TETTIGONIIDAE)

BY

T. KARABAG *ref.*



Pp. 1-41; 136 Text-figures

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REVISION OF *DRYMADUSA* STEIN AND RELATED GENERA (ORTHOPTERA : TETTIGONIIDAE)

By T. KARABAG

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INTRODUCTION

THE genus *Drymadusa* described a hundred years ago still remains insufficiently known. Ramme revised it in 1939, but somewhat superficially and did not include all the species referred to it by various authors.

When I assembled the material for this revision, it became evident that more than one generic complex was represented and three new genera had to be erected. Dr. B. P. Uvarov also drew my attention to the genus *Ceraecercus* described by him in 1910, which also belongs to this group of genera.

Three species described in the genus *Paradrymadusa* and referred by Ramme (1939) to *Drymadusa* have been left out as follows: *Paradrymadusa picta* Uvarov, 1929, *Ann. Mus. Zool. Acad. Sci. URSS* : 334; *Paradrymadusa beckeri* Adelung, 1907, *Hor. Soc. ent. Ross.* **36** : 45; *Paradrymadusa robusta* Miram, 1926, *Rev. russe Ent.* **20** : 277.

In their generic characters, these species approach *Paradrymadusa* rather than *Drymadusa*, particularly as regards the appendages of the last tergite of the male, and the absence of the concave ventral plate which is characteristic of females of our group. Some suggestion of this plate is seen only in *P. picta*.

Amongst the new genera, *Exodrymadusa* is based only on the female sex, which, however, presents such excellent characters that I feel justified in describing it.

In listing the distribution of species, I omitted some published records, since many old determinations are unreliable.

I am sincerely grateful to Dr. B. P. Uvarov for his valuable advice and help throughout this work. I also wish to thank Dr. M. Beier (Vienna), Professor G. Bei-Bienko (Leningrad), Señor E. Morales Agacino (Madrid), Dr. K. Günther (Berlin) for the loan of types, and Dr. D. R. Ragge who helped to obtain them. To the

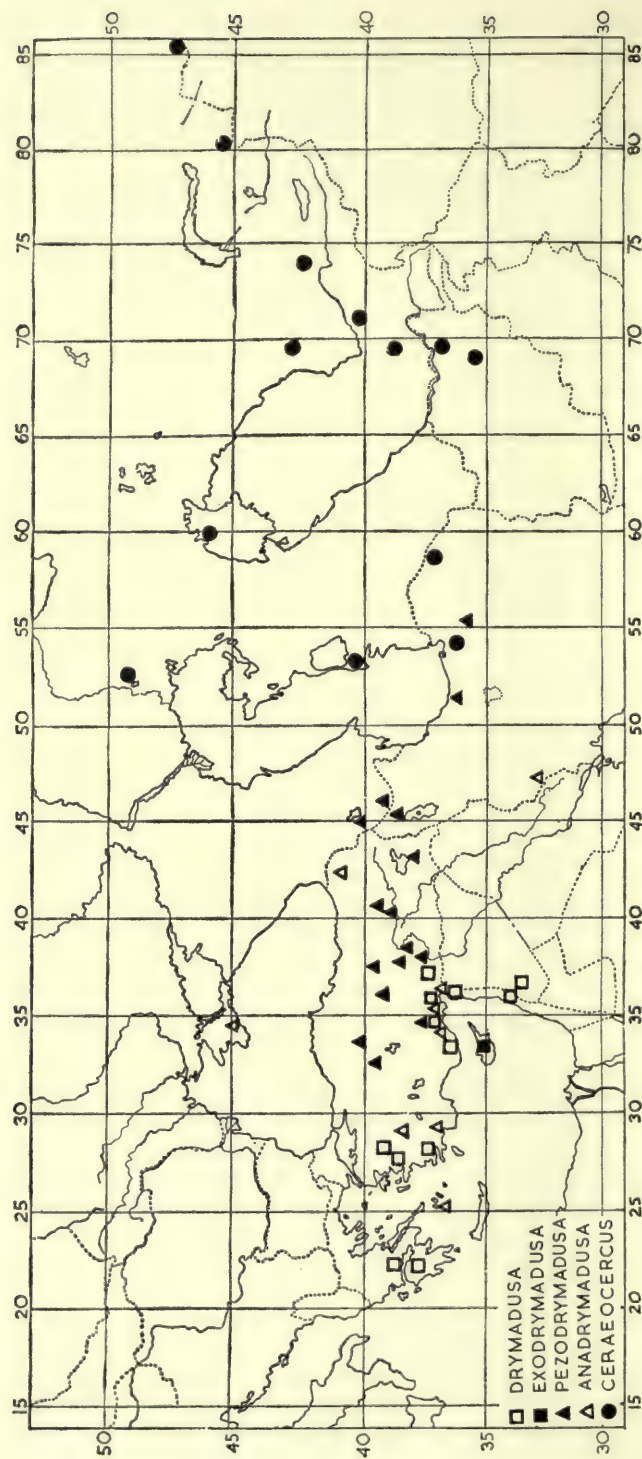


FIG. 1. Distribution of genera.

authorities of the British Museum (Natural History), especially to Dr. W. E. China, I express my appreciation of the facilities provided for this work. The work has been partly assisted by a grant from the Arid Zone Committee of UNESCO, for which I am very grateful.

Types of new species have been deposited in the British Museum (Natural History).

KEY TO THE GENERA

- 1 (8) Wings hyaline. Last tergite of male with long and acute appendages (Text-figs. 7-9, 45-55); cercus (Text-figs. 10-12, 26-44) not branched; basal branches of titillator without thickened bases (Text-figs. 13-15, 56-72). Between VII sternite and subgenital plate of female there is an extra plate with a pair of deep, shiny concavities (except *Anadrymadusa retowskii* Adelung).
- 2 (5) Posterior margin of pronotum parabolic (Text-figs. 2, 3).
- 3 (4) Pronotum without median carina; with a distinct transverse depression a little behind the typical sulcus; shoulder excision distinct (Text-figs. 2, 2A); a black or light stripe round posterior edge and a black spot on the shoulder excision. Elytra and wings fully developed, very large

I. *DRYADUSA* Stein

- 4 (3) Pronotum with distinct median carina on the metazona; with a weak and wide transverse depression behind the typical sulcus; shoulder excision very shallow (Text-figs. 3, 3A); pronotum without black edge or shoulder spot. Elytra and wings reaching middle of abdomen (♂ unknown)

II. *EXODRYADUSA* gen. n.

- 5 (2) Posterior margin of pronotum broadly rounded (Text-figs. 4-6).
- 6 (7) Metazona of pronotum convex (Text-fig. 4A) (if flat, then shoulder excision distinct); lateral carina weak; shoulder excision indistinct. Elytra shorter than half of abdomen. Ovipositor much shorter than twice the length of pronotum

III. *PEZODRYADUSA* gen. n.

- 7 (6) Metazona of pronotum flat; lateral carina distinct on the metazona; shoulder excision distinct (Text-figs. 5, 5A) (in *retowskii* very shallow). Elytra mostly longer than half of abdomen. Ovipositor more than twice the length of pronotum

IV. *ANADRYADUSA* gen. n.

- 8 (1) Wings black, or brown with lighter fenestration. Last tergite of male with two broad lobes, each strongly down-curved, ending in a very small acute spine (Text-figs. 131, 131A); cercus (Text-fig. 132) with two branches; basal branches of titillator with thickened bases (Text-fig. 73). No bi-concave plate between VII sternite and subgenital plate of female (Text-fig. 136)

V. *CERAEOCERCUS* Uvarov

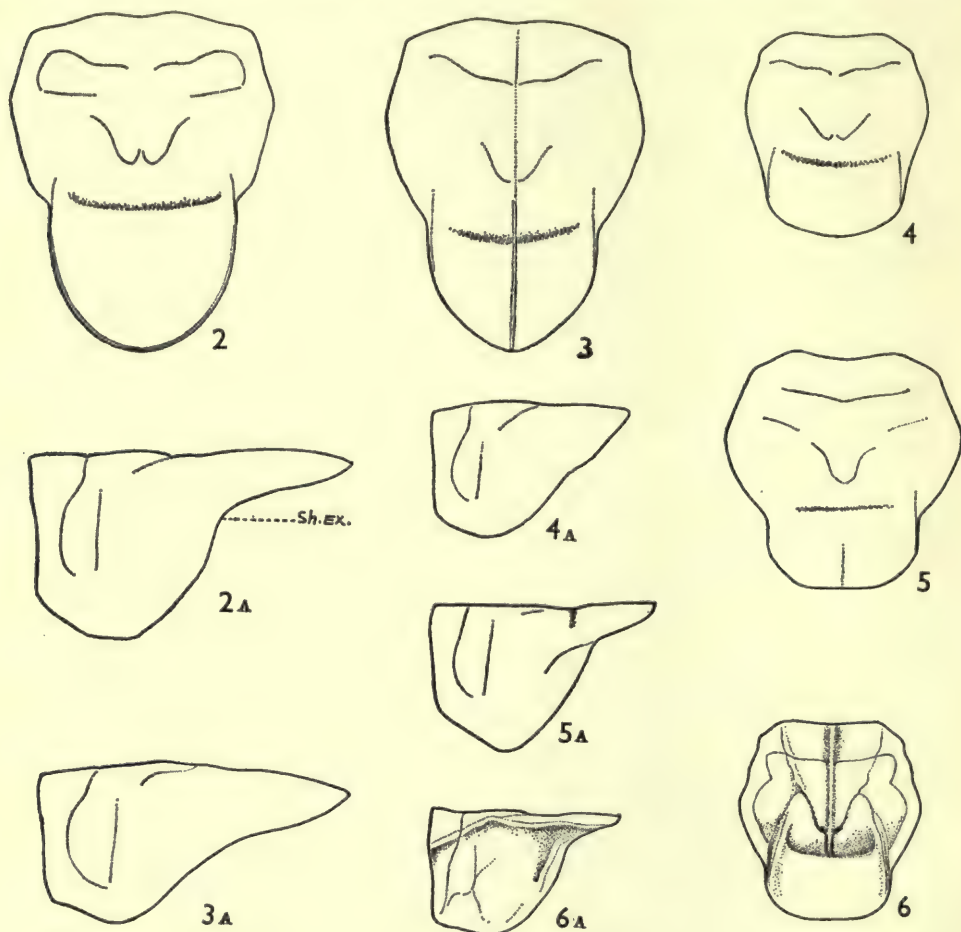
I. *DRYADUSA* Stein, 1860

1860. *Dryadusa* Stein, *Berl. ent. Zeitschr.* 4: 257.
 1874. *Dryadusa* Herman, *Verh. Zool.-bot. Ges. Wien*, 24: 199, 206.
 1882. *Dryadusa* Brunner-Wattenwyl, *Prodr. eur. Orthopt.*: 313.

Fastigium of vertex wider than first antennal segment, suddenly narrowed at the front, with very fine median sulcus. Between eyes there is a typical black transverse band. First sulcus of pronotum distinct; typical sulcus almost in the middle of pronotum. Hind femur very strong and large.

♂. Appendages of last tergite very long and acute. Cercus stout, with an enlarged basal articulation; basal part much longer than the apical, incurved. Subgenital plate longer than wide, with a deep roundly-angular excision.

♀. Last tergite with long spine-like appendages. Between VII sternite and subgenital plate there is a ventral plate, which is much longer and wider than the VII



FIGS. 2-6. Pronotum of male. 2, *Drymadusa limbata limbata* Br.-W.; 2A, in profile; Sh. Ex. = shoulder excision; 3, *Exodrymadusa inornata* (Uv.); 3A, in profile; 4, *Pezodrymadusa angorensis* (Uv.); 4A, in profile; 5, *Anadrymadusa spinicercis* (Karab.); 5A, in profile; 6, *Ceraeocercus fuscipennis fuscipennis* Uv.; 6A, in profile.

sternite, and has a pair of elongate shiny concavities, separated by a high and stout median carina. Subgenital plate with a deep acutangular excision. Ovipositor long and very stout, slightly decurved.

Type of genus *Ephippigera dorsalis* Brullé, 1832.

The bi-concave ventral plate of the female is a most important generic character, but it is not clear whether it forms a part of the VII sternite or of the subgenital plate.

DISTRIBUTION. Greece, Turkey, Syria.

KEY TO SPECIES

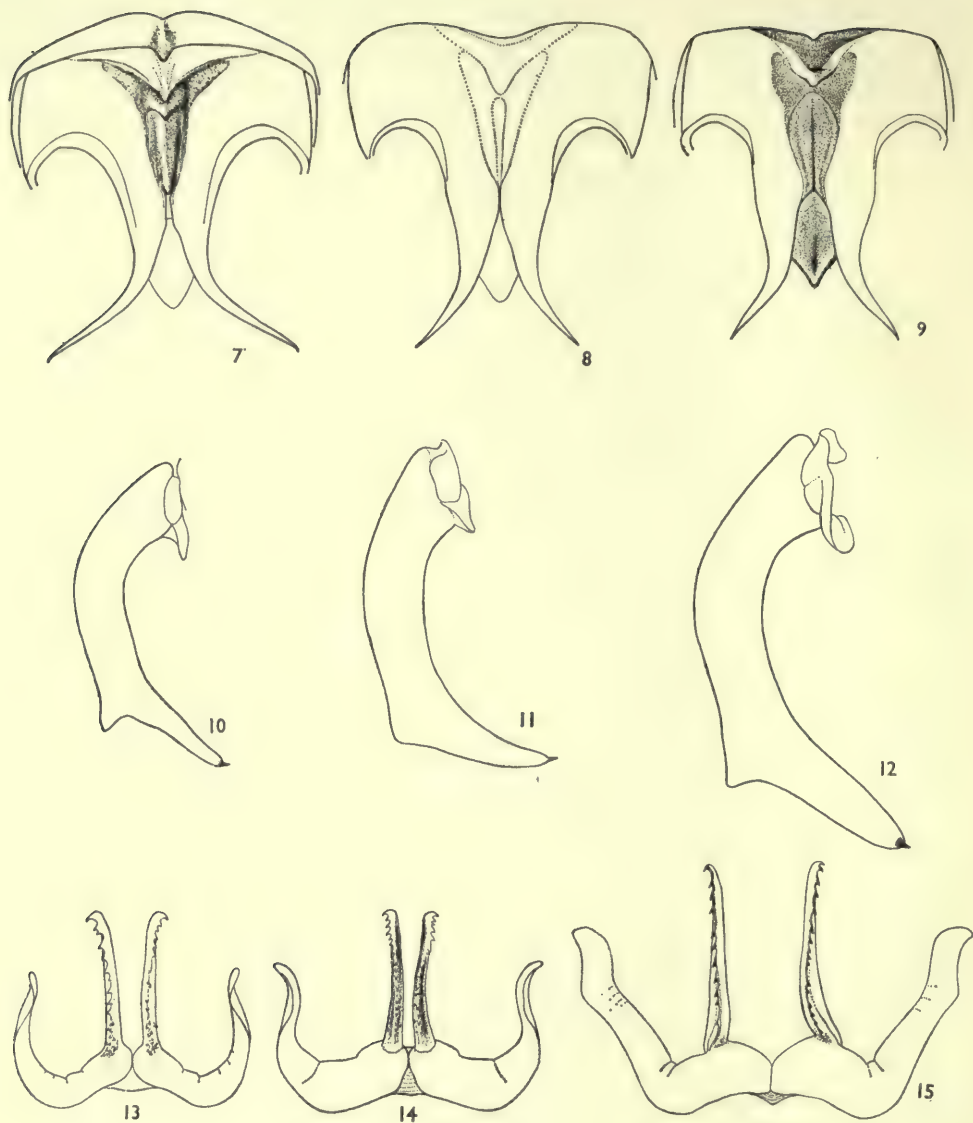
- 1 (2) A narrow and short, not very distinct, black spot at the corner of shoulder excision; elytra grey, with white, irregular spots and pattern, without blackish spot at the base.
 σ : Appendages of last tergite very long, spine-like, thin (Text-fig. 7); cercus slender, its apical part much thinner than the basal, outer angle attenuated, acute (Text-fig. 10); middle branches of titillator with strong teeth in a longitudinal line, its basal branches narrow (Text-fig. 13).
 φ : Appendages of last tergite long (Text-fig. 19), slightly divergent; median carina of bi-concave plate very wide and stout; subgenital plate approximately as long as wide (Text-fig. 21) 1. *dorsalis* (Brullé)
- 2 (1) A very distinct black spot at the corner of shoulder excision. Elytra light or dark reddish-brown, with irregular dark spots, and a long dark brown or blackish spot at the posterior basal angle. σ : Cercus stout, outer angle not acute (Text-figs. 11, 12); basal branches of titillator very wide (Text-figs. 14, 15).
3 (4) Pronotum more slender. Elytra not very wide. σ : Appendages of last tergite as in Text-fig. 8; cercus not very large (Text-fig. 11), gradually incurved, its apical part tapering, outer angle rounded; titillator (Text-fig. 14) strong, its basal branches regularly incurved, central branches near each other, with dense teeth in a longitudinal line. φ : Bi-concave ventral plate as in Text-fig. 22
. 2. *limbata limbata* (Br.-W.)
- 4 (3) Pronotum very stout. Elytra very wide. σ : Appendages of last tergite as in Text-fig. 9; cercus very large, strongly incurved at the basal third (Text-fig. 12), its apical part very long and thick, outer angle subacute; titillator (Text-fig. 15) very large and stout, its basal branches very long, middle branches not near each other; φ : bi-concave plate, see Text-fig. 23
. 3. *limbata grandis* sbsp. n.

1. *Drymadusa dorsalis* (Brullé, 1832)

1832. *Ephippigera dorsalis* Brullé, *Exped. sc. de Moreé, Zool.*: 90, plate XXIX, fig. 8 (larva).
1860. *Drymadusa spectabilis* Stein, *Berl. ent. Zeitschr.* 4: 258.
1861. *Gampsocleis spectabilis* Brunner-Wattenwyl, *Verh. Zool.-bot. Ges. Wien*, 11: 288, pl. IX, fig. 3, A, B, C, D.
1874. *Drymadusa spectabilis* Herman, *Verh. Zool.-bot. Ges. Wien*, 24: 206, pl. IV, figs. 43-48.
1882. *Drymadusa spectabilis* Brunner-Wattenwyl, *Prodr. eur. Orthopt.*: 313, 314.

Pronotum relatively slender, pro- and mesozona slightly convex, metazona flattened; posterior edge of pronotum almost half circle. Elytra not very wide.

Face uniformly light brown, occiput darker; black band between eyes very distinct; posterior margin of pronotum with black edge. Legs light greyish-brown, outer surface darker, with marked pattern, a short transverse series of blackish-brown stripes on the basal upper edge.



FIGS. 7-15. 7, *Drymadusa dorsalis* (Brullé): ♂ last tergite; 8, *D. limbata limbata* Br.-W., ♂ last tergite; 9, ♂ *D. limbata grandis* sbsp. n. last tergite; 10, *D. dorsalis* (Brullé), ♂ left cercus; 11, *D. limbata limbata*, Br.-W., ♂ left cercus; 12, *D. limbata grandis* sbsp. n., ♂ left cercus; 13, *D. dorsalis* (Brullé), ♂ titillator; 14, *D. limbata limbata* Br.-W., ♂ titillator; 15, *D. limbata grandis* sbsp. n. ♂ titillator.

♂. Appendages of last tergite very long, spine-like, strongly down-curved. Subgenital plate (Text-fig. 16), with subacute excision, styli not very long.

♀. Face more reddish-brown than in ♂, occiput darker, and more convex; appendages of last tergite long, spine-like; VII, VIII and IX sternites each with a small median projection; VII sternite is smallest, weakly convex; basal part of the median carina of bi-concave ventral plate wide; ovipositor almost straight.

Length of body, ♂, 44.1–46.1, ♀, 42.6; pronotum, ♂, 13.7–14, ♀, 13.6; elytra, ♂, 46.4–48, ♀, 54; fore femur, ♂, 12–12.3, ♀, 12; hind femur, ♂, 38–38.7, ♀, 38.9–40.4; ovipositor, 32 mm.

Specimens examined: Parnass, Greece, 1 ♂, 1 ♀ (Krüper), 42 (Mus. Vienna); Greece, 1 ♀ larva, 70/47 (labelled *Ephippigera dorsalis* ??); Peloponesus, Micaene, 1 ♂, vii. 1938 (O. Grebenchikoff); Greece, 1 ♀ larva, 70'47 (British Museum).

Herman (1874) mentioned this species also from Asia Minor, but without exact locality and the record is doubtful.

2. *Dryadusa limbata limbata* Br.-W., 1882

1882. *Dryadusa limbata* Brunner-Wattenwyl, *Prodr. eur. Orthopt.*: 314 (Partim).

Pronotum long, metanotum very long and parabolic, with a light line round the posterior margin. Elytra extend beyond hind knee, not very wide. Hind femur relatively stout. ♂: Subgenital plate much longer than wide, with a deep angular excision (Text-fig. 17). ♀: Subgenital plate large and convex, with a depression in the middle of its apical part; ovipositor regularly down-curved.

Coloration reddish-brown (some specimens paler). Metazona darker; hind femur more or less marbled, with a dark brown (in some specimens lighter) ring in the middle.

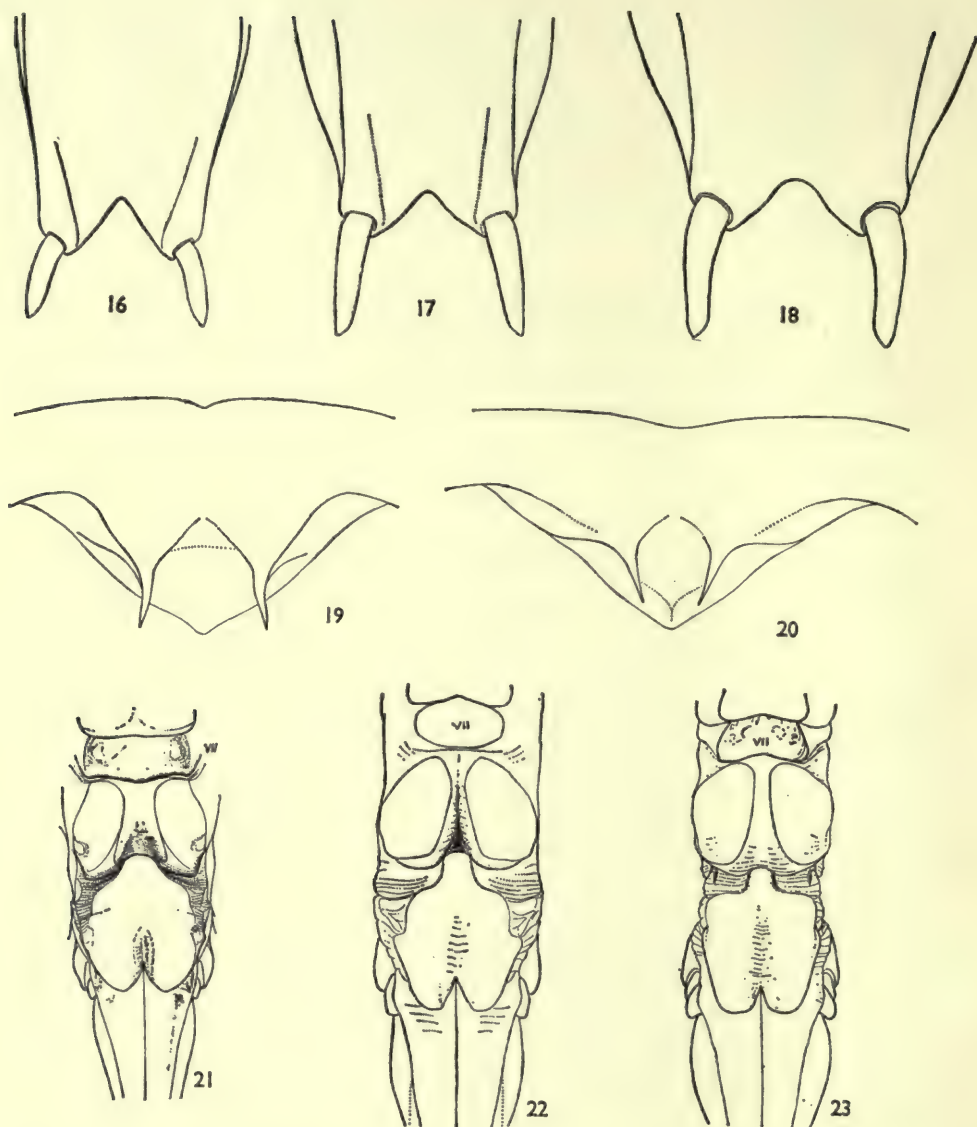
Length of body, ♂, 44.4–45.6, ♀, 45.5–48.3; pronotum, ♂, 12.6–15.2, ♀, 13–13.5; elytra, ♂, 42.1–52.1, ♀, 55–58.5; fore femur, ♂, 12.6, ♀, 11.2–12.3; hind femur, ♂, 35.8–41.6, ♀, 38.3–40.2; ovipositor, 27.1–27.9 mm.

Specimens examined: Smyrna, W. Turkey, 1 ♂ (Brunner-Wattenwyl), 5941 (Mus. Vienna); Manisa, W. Turkey; Kurkcü, 10.vii.1933, 1 ♂, 7–10.viii.1941, 2 ♂, 1 ♀, 14.vi.1944, 1 ♂, 1 ♀ larva, 20.viii.1944, 1 ♀ (Zoological Institute, University of Ankara).

I examined Brunner's ♂ from Smyrna (Izmir) and designate it here as the type. It is a little larger and darker than the Manisa specimens, but other characters agree.

Brunner (1882) recorded this species also from Damascus and Beirut, and Werner (1901, *Sitzber. Akad. Wiss., Mathem.-naturw. Cl.* 110: 290) mentioned specimens from Cilician Taurus, Bimbogha Dag, Ala Cheir (Turkey) and Samos (Greece).

Werner's Ala Cheir (= Alaşehir) record is very likely to be *D. limbata limbata* as this place is near the type locality; Bimbogha Dag records a Cilician Taurus specimen, which was a ♀ larva, and the Syrian records probably belong to the next subspecies. The record from Samos is quite uncertain.



FIGS. 16-23. 16, *Drymadusa dorsalis* (Brullé), ♂ subgenital plate; 17, *D. limbata limbata* Br.-W., ♂ subgenital plate; 18, *D. limbata grandis* sbsp. n., ♂ subgenital plate; 19, *D. dorsalis* (Brullé), ♀ appendages of last tergite; 20, *D. limbata grandis* sbsp. n., ♀ appendages of last tergite; 21, *D. dorsalis* (Brullé), ♀ VII sternite, bi-concave plate, subgenital plate and basis of ovipositor; 22, *D. limbata limbata* Br.-W., ♀ VII sternite, bi-concave plate, subgenital plate and basis of ovipositor; 23, *D. limbata grandis* sbsp. n., ♀ VII sternite, bi-concave plate, subgenital plate and basis of ovipositor.

3. *Dryadusa limbata grandis* sbsp. n.

1882. *Dryadusa limbata* Brunner-Wattenwyl, *Prodr. eur. Orthopt.* : 314 (Partim).

♂. Larger than *D. limbata limbata*, and differs from it in the following characters : Pronotum stout, metazona more elongate, not flattened, posterior edge more parabolic ; elytra and wings very large, extending well beyond the hind knee ; hind femur very stout. Subgenital plate much longer than wide, with a deep and subacute excision (Text-fig. 18).

General coloration dark reddish-brown, face lighter, unicolourous ; first four segments of antennae black anteriorly ; upper surface of pronotum dark, particularly at the metazona ; a light stripe round posterior margin ; elytra with light brown irregular black spots ; a large dark brown ring on the middle of hind femur.

♀. Appendages of last tergite (Text-fig. 20), long and spine-like. The bi-concave ventral plate very large, longer than subgenital plate ; ovipositor strong, slightly down-curved.

Coloration as in ♂, but darker.

Length of body, ♂, 45-50.2 (type), ♀, 45.8-55.6 ; pronotum, ♂, 15.1-16.8 (type)—17.3, ♀, 15.2-17.8 ; elytra, ♂, 55.3 (type)—58.6, ♀, 62-68 ; fore femur, ♂, 12.2-13.1 (type), ♀, 13-14 ; hind femur, ♂, 42.5-45 (type), ♀, 44-46.1 ; ovipositor, 30.1-36 mm.

Specimens examined : Adana, S. Turkey, 1 ♂ (type), 25.5.10 ; Göl-banhi (=Göl-başı), 1882, 1 ♀ (Lushan) (Vienna Museum) ; Kuzucubeleni, Mersin Dist., 1936, 1 ♂ (Mr. Cotton) ; Asia Minor, Pres. by Robt. M. Anderson, 58.161 ; Marash, 1931, 1 ♀ (E. Cold.), 1931-334 ; Mugla, Agia, c. 1,000 m., 22.vii.1947, 1 ♀ (M. Burr), 1947-350 (British Museum) ; Hatay-Yayladag, Yenice Köy, 5.viii.1951, 1 ♂, 1 ♀ ; Mersin-Silifke, 28.viii.1952, 1 ♂, 1 ♀ (Ö. K. Gülen) ; Mersin, 22, 23, 28.vii.1952, 3 ♀ ; Mersin-Gülnar, Bozaga Köyü, 15.ix.1952, 1 ♀ ; Mersin-Cevlik Köyü, 8.vii.1952, 2 ♀ (Ö. K. Gülen) (Zoological Institute, University of Ankara).

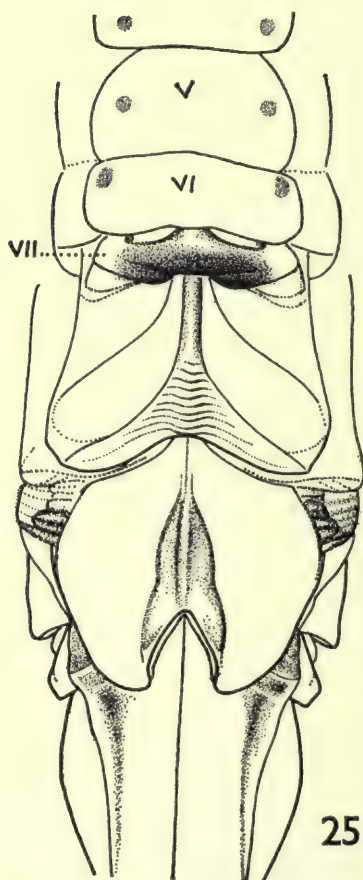
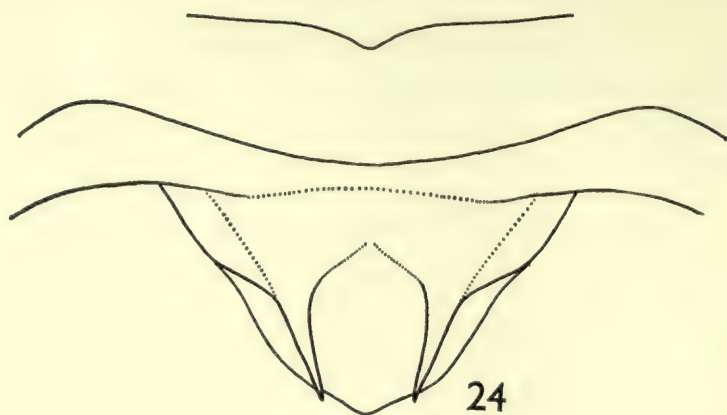
This new subspecies was sent to me from the Vienna Museum as *D. limbata* Br.-W., but it proved to be distinct in the size of pronotum, elytra, hind femur and structure of cercus and titillator. The type has been returned to the Vienna Museum.

Previous records of *D. limbata* from Syria probably refer to this subspecies.

II. *EXODRYADUSA* gen. n.

Type : *Dryadusa inornata* Uvarov, 1926.

♀. Fastigium of vertex with fine median sulcus. Between eyes there is a black transverse band. Pronotum stout, relatively long and distinctly convex in profile ; median carina slightly perceptible in prozona and distinct in metazona ; first transverse sulcus distinct ; typical sulcus roundly curved behind the middle of pronotum ; lateral lobes oblique, convex. Elytra with parabolic apices. Appendages of last tergite long and acute (Text-fig. 24) ; bi-concave ventral plate very large (Text-fig. 25) ; ovipositor long.



FIGS. 24-25. *Exodrymadusa inornata* (Uv.). 24, ♀ appendages of last tergite; 25, V-VII sternites, bi-concave plate, subgenital plate and basis of ovipositor.

***Exodrymadusa inornata* (Uvarov, 1936)**

1936. *Drymadusa inornata* Uvarov, *Ann. Mag. nat. Hist.* 38 : 510.

♀. Large and robust. Lateral pronotal lobes much longer than deep, their front margin straight. Elytra reaching slightly beyond the third tergite. Hind femur relatively short and slender. Subgenital plate broadly oval, with double sulcus and distinct median carinula ; the second half with a sulcus on each side ; lobes slightly incurved, with a deep acutangular excision. Ovipositor nearly as long as the hind femur, very slightly decurved, with the apex tapering to a point.

Coloration uniformly dull brown ; face light brown, with black band between eyes ; front of first and half of second antennal segments blackish. Pronotum without pattern. Elytra uniformly dark brown, a small elongated dark brown spot at the posterior basal angle of elytra ; legs greyish brown.

Length of body, 33-41.3 ; pronotum, 13.1-15 ; elytra, 12-14.3 ; fore femur, 11.1-14.3 ; hind femur, 11.1-12 ; ovipositor, 29-30 mm.

Specimens examined : Cyprus, Limassol, June, 1919, 1 ♀ (type) ; Cyprus, Staurovouni Mt., 2,400 ft., 25.v.1937, 1 ♀, 1 ♀ larva ; Pera-Pedi, 2,500 ft., 23.vii.1937, 1 ♀ (G. A. Mavromoustakis) (British Museum).

It would be extremely interesting to study the male of this very distinct insect.

III. *PEZODRYMADUSA* gen. n.

Type : *Drymadusa angorensis* Uvarov, 1931.

Pronotum cylindrical, convex in pro- and mesonotum, metanotum mostly not flattened ; behind typical sulcus a wide transversal depression ; no median carina ; lateral carinae distinct only at the shoulders ; shoulder excision very shallow ; first sulcus distinct ; typical sulcus less distinct, widely curved a little behind the middle. Elytra shorter than half of abdomen.

Face with a distinct narrow black or dark brown band between eyes. Pronotum usually with typical X-shaped pattern.

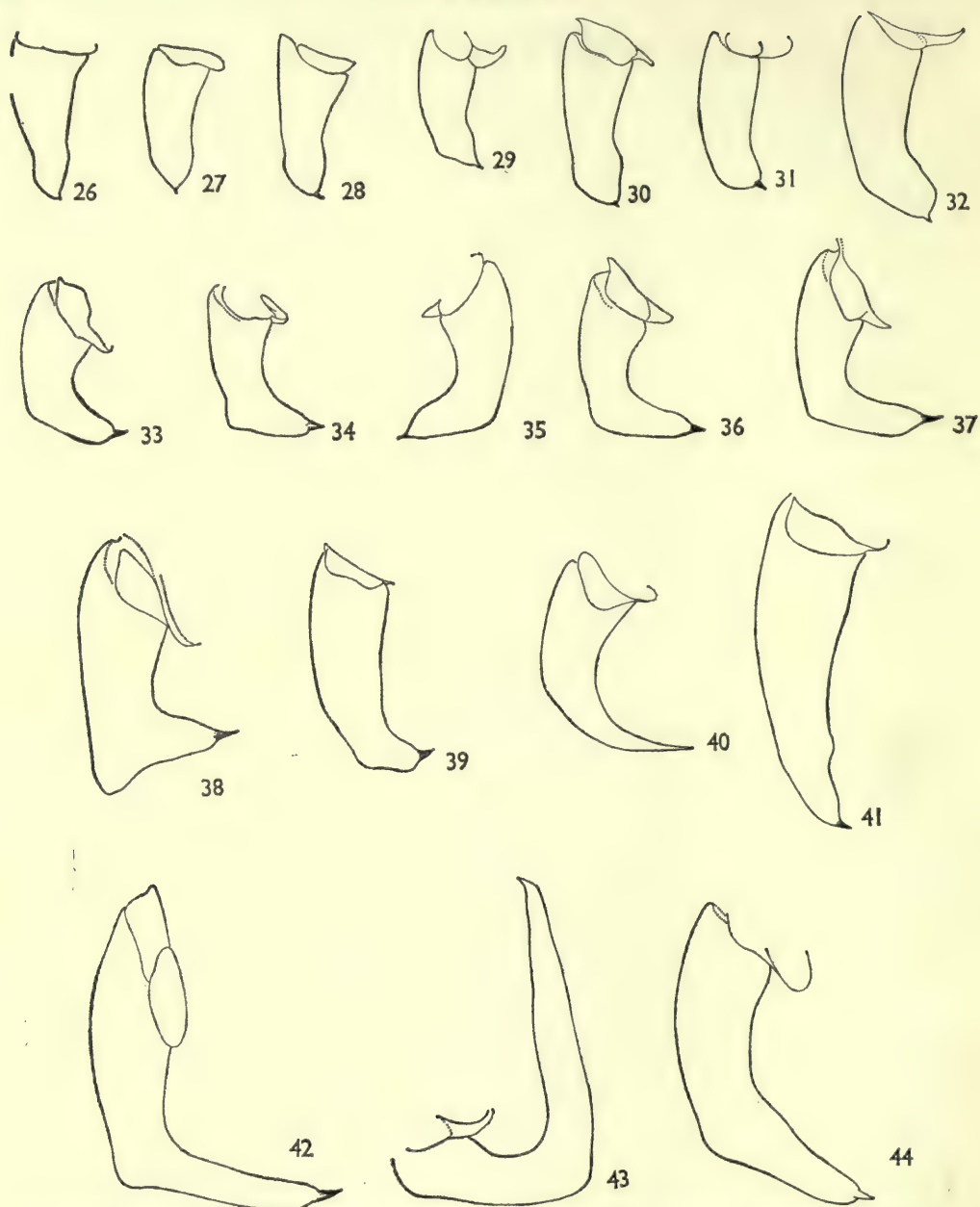
♂. Subgenital plate longer than wide, with a round excision ; styli very short, cylindrical ; cercus with enlarged basal articulation.

♀. Bi-concave ventral plate present ; ovipositor stout, shorter than $1\frac{1}{2}$ times pronotum, distinctly and regularly down-curved.

DISTRIBUTION. Turkey, Transcaucasia, Iran.

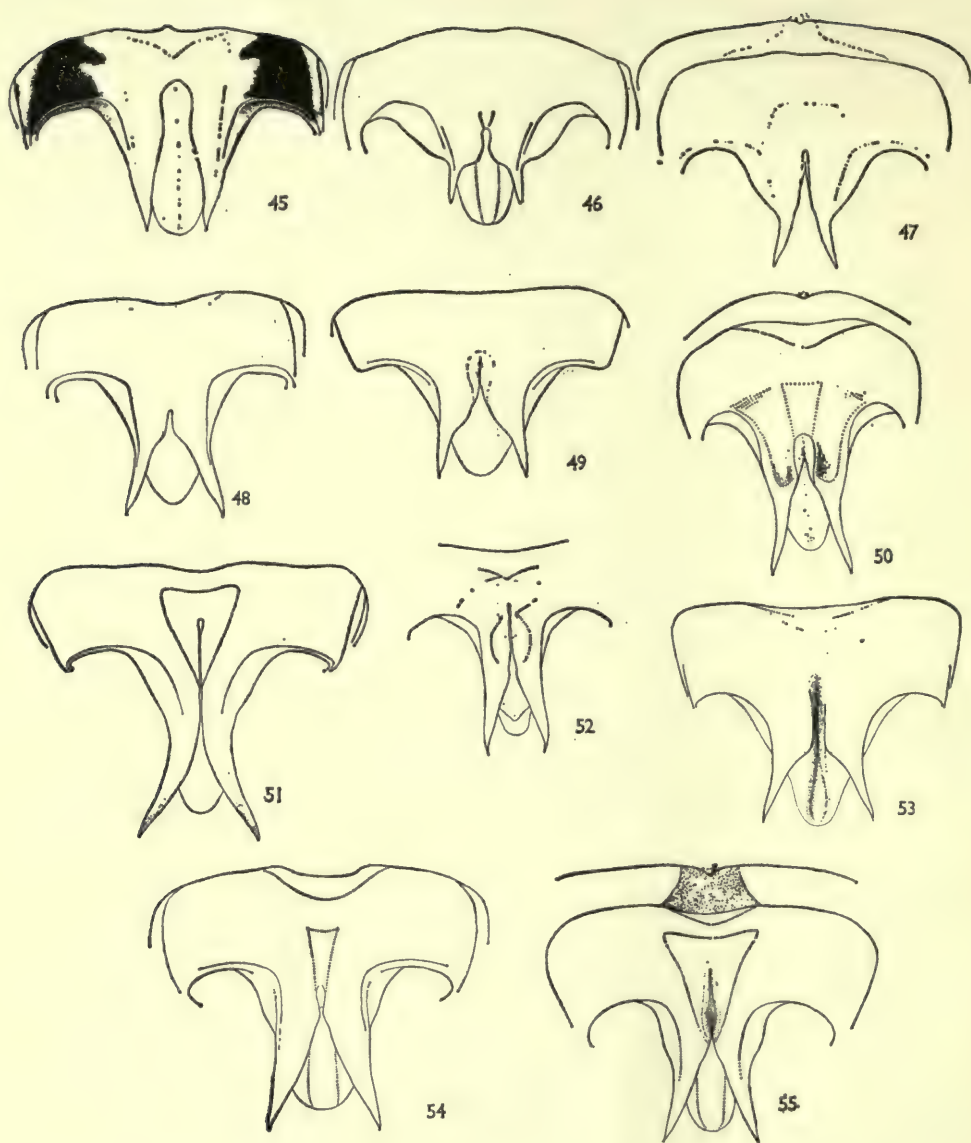
KEY TO SPECIES*Male*

- 1 (14) Cercus straight or slightly incurved (Text-figs. 26-32).
- 2 (7) Cercus straight (Text-figs. 26-28).
- 3 (4) Sides of last tergite black ; its appendages long, stout, almost parallel, joined at the base (Text-fig. 45) ; cercus gradually narrowed to the apical third, which is slightly S-shaped, with a small apical tooth (Text-fig. 26) ; median branches of titillator stout, with strong and numerous spines, without spines on its basal part (Text-fig. 56) 1. *magnifica* (Werner)

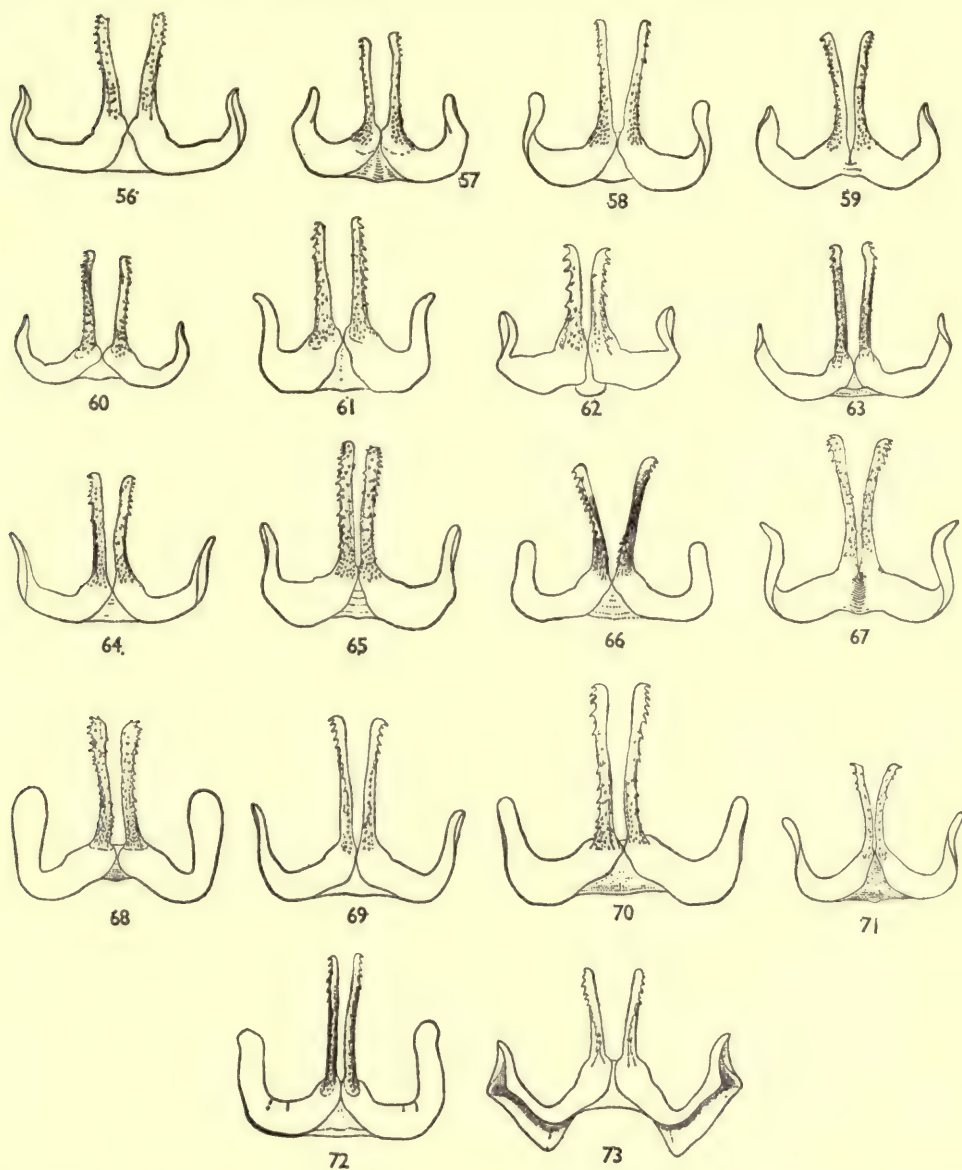


FIGS. 26-44. Left cercus of ♂. 26, *Pezodrymadusa magnifica* (Wern.); 27, *P. subinermis* sp. n.; 28, *P. konowi* (Bol.); 29, *P. indivisa* sp. n.; 30, *P. kurmana* (Rme.); 31, *P. lata* sp. n.; 32, *P. uvarovi* sp. n.; 33, *P. sinuata* Rme.; 34, *P. grisea* (Rme.); 35, *P. diffusa* (Rme.), right cercus; 36, *P. striolata* (Rme.); 37, *P. angorensis* (Uv.); 38, *Anadrymadusa spinicercis* (Karab.); 39, *A. ornatipennis* (Rme.); 40, *A. retowskii* (Adel.); 41, *A. adzharica* (Uv.); 42, *A. brevipennis* (Br.-W.); 43, *A. curvicercis* (Uv.); 44, *A. recticauda* (Wern.).

- 4 (3) Last tergite unicolourous, its appendages short and thin (Text-figs. 46, 47); median branches of titillator slender, with small and numerous spines including their basal parts (Text-figs. 57, 58).
- 5 (6) Elytra not black, with irregular brown spots; appendages of last tergite very short and almost parallel (Text-fig. 46); cercus as in Text-fig. 27; median branches of titillator very thin, with a few fine spines (Text-fig. 57)
2. *subinermis* sp. n.
- 6 (5) Elytra black, with irregular creamy spots; appendages of last tergite long and strongly divergent (Text-fig. 47); cercus narrowed gradually to the last third, then slightly thickened, with a strong apical tooth (Text-fig. 28); median branches of titillator long and strong, with numerous spines (Text-fig. 58)
3. *konowi* (I. Bolivar)
- 7 (2) Cercus slightly incurved (Text-figs. 29-32).
- 8 (9) Apical part of cercus long, strongly convex on the inner side, its outer edge almost straight, with a small apical tooth (Text-fig. 32); appendages of last tergite very long, strongly divergent (Text-fig. 51); median branches of titillator short and stout, with very strong teeth (Text-fig. 62) 4. *uvarovi* sp. n.
- 9 (8) Apical part of cercus short, not strongly convex on the inner side (Text-figs. 29-31); appendages of last tergite not very long, slightly divergent (Text-figs. 48-50).
- 10 (11) Apical part of cercus subtriangular, with a convexity near apex and a long apical tooth (Text-fig. 29); basal parts of titillator fused, its median branches with dense teeth (Text-fig. 59) 5. *indivisa* sp. n.
- 11 (10) Apical part of cercus rounded (Text-figs. 30, 31).
- 12 (13) Apical part of cercus subacute, its apical third distinctly convex, with a small apical tooth (Text-fig. 30) basal branches of titillator very narrow, median branches with numerous spines (Text-fig. 60); upper surface of pronotum blackish-brown, except posterior edge of metazona 6. *kurmana* (Ramme)
- 13 (12) Apical part of cercus round, with a strong apical tooth (Text-fig. 31); basal branches of titillator wide at the middle, median branches stout and with strong and numerous teeth (Text-fig. 61); upper surface of pronotum dirty dark brown 7. *lata* sp. n.
- 14 (1) Cercus strongly incurved (Text-figs. 33-37).
- 15 (18) Apical part of cercus distinctly shorter than the basal (Text-figs. 33, 34).
- 16 (17) Appendages of last tergite gradually narrowing, weakly divergent (Text-fig. 52); apical part of cercus scarcely narrowed to a rounded apex, without distinct knee (Text-fig. 33) (titillator in the paratype missing) 8. *sinuata* (Ramme)
- 17 (16) Appendages of last tergite suddenly narrowed in the apical half, strongly divergent (Text-fig. 53); apical part of cercus subacute, with a distinct knee (Text-fig. 34); basal branches of titillator very narrow, median branches strong, with a line of strong teeth (Text-fig. 63) 9. *grisea* (Ramme)
- 18 (15) Cercus with the apical part not shorter than the basal (Text-figs. 35-37).
- 19 (20) Apical part of cercus short and thick, strongly convex on the inner side (Text-fig. 35) 10. *diffusa* (Ramme)
- 20 (19) Apical part of cercus long, tapering (Text-figs. 36, 37).
- 21 (22) Apical part of cercus as long as basal (Text-fig. 36); basal branches of titillator very narrow, median branches stout, with strong teeth (Text-fig. 64)
11. *striolata* (Ramme)
- 22 (21) Apical part of cercus longer than the basal (Text-fig. 37); basal branches of titillator wide, median branches with strong teeth (Text-fig. 65)
12. *angorensis* (Uvarov)



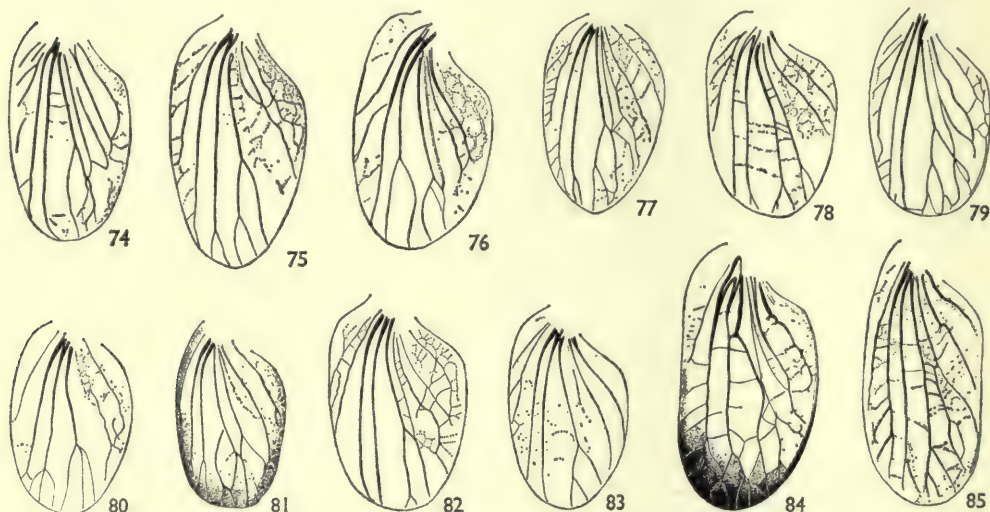
FIGS. 45-55. Last tergite of ♂. 45, *Pezodrymadusa magnifica* (Wern.); 46, *P. subinermis* sp. n.; 47, *P. konowi* (Bol.); 48, *P. indivisa* sp. n.; 49, *P. kurmana* (Rme.); 50, *P. lata* sp. n.; 51, *P. uvarovi* sp. n.; 52, *P. sinuata* (Rme.); 53, *P. grisea* (Rme.); 54, *P. striolata* (Rme.); 55, *P. angorensis* (Uv.).



FIGS. 56-73. ♂ titillator. 56, *Pezodrymadusa magnifica* (Wern.); 57, *P. subinermis* sp. n.; 58, *P. konowi* (Bol.); 59, *P. indivisa* sp. n.; 60, *P. kurmana* (Rme.); 61, *P. lata* sp. n.; 62, *P. uvarovi* sp. n.; 63, *P. grisea* (Rme.); 64, *P. striolata* (Rme.); 65, *P. angorensis* (Uv.); 66, *Anadrymadusa brevipennis* (Br.-W.); 67, *A. curvicercis* (Uv.); 68, *A. spinicercis* (Karab.); 69, *A. recticauda* (Wern.); 70, *A. adzhарica* (Uv.); 71, *A. retowskii* (Adel.); 72, *A. ornatipennis* (Rme.); 73, *Ceraeocercus fuscipennis fuscipennis* Uv.

Female

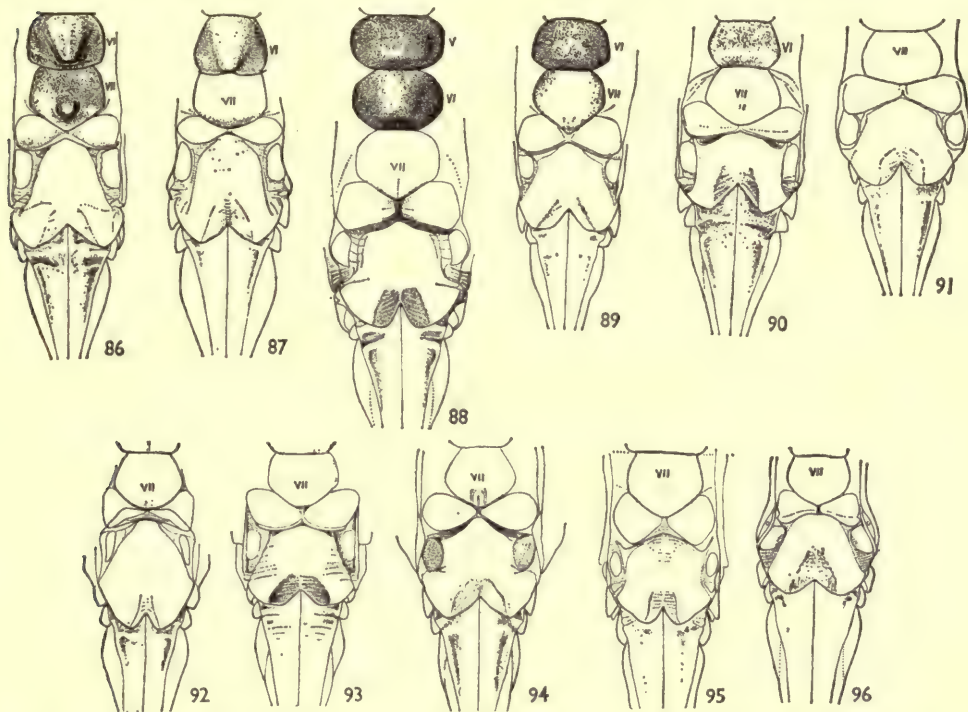
- 1 (12) VI sternite with a more or less distinct convexity (Text-figs. 86–90).
- 2 (5) VII sternite with a tubercle or distinct convexity (Text-figs. 86, 87, 97, 98).
- 3 (4) VI and VII sternites with a distinct tubercle (Text-figs. 86, 97); pronotum with typical pattern; hind femur with a light brown spot on the upper edge near the base, outer surface unicolourous ***sinuata*** (Ramme)
- 4 (3) VI sternite with a convexity, VII sternite without tubercle, but its apical part strongly convex (Text-figs. 87, 98); pronotum without typical pattern; hind femur with an elongated black spot on the upper edge near the base and a long black stripe on the middle of outer surface ***uvarovi*** sp. n.
- 5 (2) VII sternite without tubercle and not strongly convex (Text-figs. 88–90, 99–102).
- 6 (9) Pronotum with typical pattern.



FIGS. 74–85. ♀ left elytra. 74, *Pezodrymadusa sinuata* (Rme.); 75, *P. uvarovi* sp. n.; 76, *P. angorensis* (Uv.); 77, *P. affinis* (Bol.); 78, *P. diffusa* (Rme.); 79, *P. kurmana* (Rme.); 80, *P. subinermis* sp. n.; 81, *P. indivisa* sp. n.; 82, *P. striolata* (Rme.); 83, *P. konowi* (Bol.); 84, *P. magnifica* (Wern.); 85, *P. grisea* (Rme.).

- 7 (8) Ovipositor longer than half of hind femur, stout (Text-fig. 99); hind femur with a small brown spot on the upper edge near the base . . . ***angorensis*** (Uvarov)
- 8 (7) Ovipositor approximately as long as half of hind femur, slender (Text-fig. 100); hind femur with a blackish-brown spot on the upper edge near the base . . . ***affinis*** (I. Bolivar)
- 9 (6) Pronotum without typical pattern.
- 10 (11) Pronotum uniformly dirty brown; apical angle of VII sternite almost acute; apical lobes of subgenital plate as in Text-fig. 89; hind femur unicolourous; apical part of ovipositor as in Text-fig. 101 ***diffusa*** (Ramme)
- 11 (10) Upper surface of pronotum, except posterior edge, blackish-brown; apical angle of VII sternite rounded; apical lobes of subgenital plate as in Text-fig. 90; hind femur with an elongated dark brown spot on the upper edge; an elongated dark brown stripe on the outer surface; apical part of ovipositor as in Text-fig. 102 ***kurmana*** (Ramme)

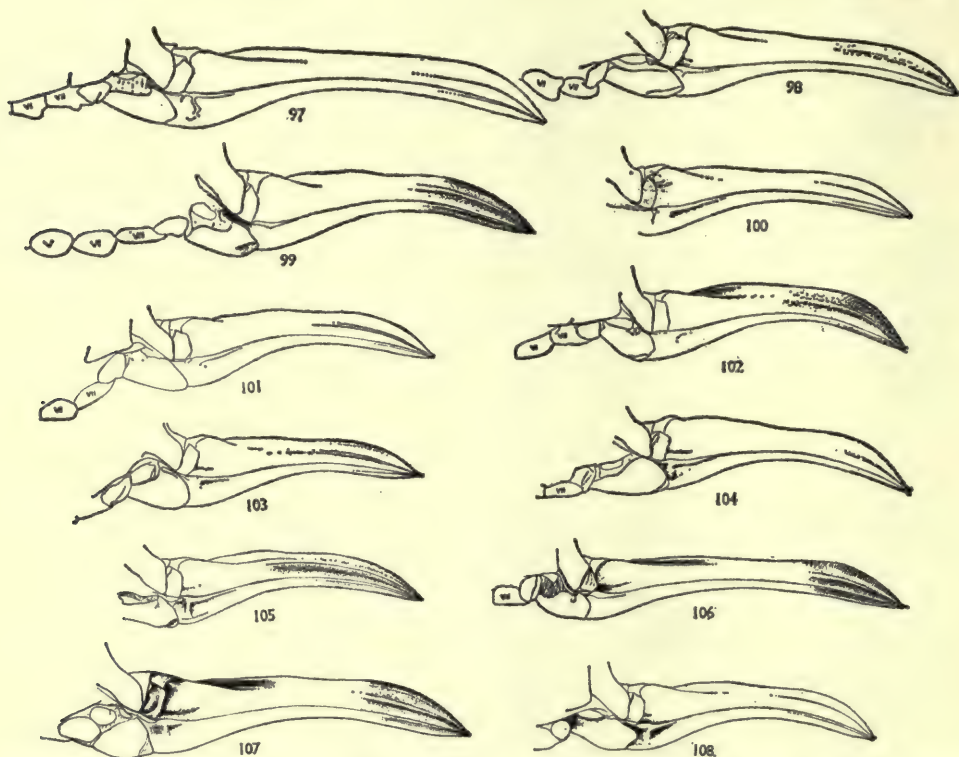
- 12 (1) VI sternite without a convexity (Text-figs. 91-96, 103-108).
 13 (14) Elytra (Text-fig. 83) black with a series of whitish spots; a big black spot on the upper edge of hind femur at the base; subgenital plate and ovipositor as in Text-figs. 94, 108 ***konowi*** (I. Bolivar)
 14 (13) Elytra not black, or only outer edge blackish.
 15 (22) Pronotum with distinct or very weak typical pattern.
 16 (21) Pronotum with distinct typical pattern; metazona not distinctly flattened. Elytra brown with irregular creamy spots.
 17 (18) Ovipositor (Text-fig. 103) shorter than half of hind femur; hind femur marbled in the basal half ***subinermis*** sp. n.



FIGS. 86-96. ♀ bi-concave plate, subgenital plate and basis of ovipositor. 86, *Pezodrymadusa sinuata* (Rme.), VI-VII sternites; 87, *P. uvarovi* sp. n.; 88, *P. angorensis* (Uv.), V-VII sternites; 89, *P. diffusa* (Rme.), VI-VII sternites; 90, *P. kurmana* (Rme.), VI-VII sternites; 91, *P. subinermis* sp. n., VII sternite; 92, *P. indivisa* sp. n., VII sternite; 93, *P. striolata* (Rme.), VII sternite; 94, *P. konowi* (Bol.), VII sternite; 95, *P. magnifica* (Wern.), VII sternite; 96, *P. grisea* (Rme.), VII sternite.

- 18 (17) Elytra blackish-brown; ovipositor longer than half of hind femur; hind femur with black spots.
 19 (20) Elytra (Text-fig. 84) apically black, without light spots; hind femur with a small black spot on the upper edge of its base and several black spots on the upper half of its outer surface; subgenital plate as in Text-fig. 107; ovipositor very stout ***magnifica*** (Werner).
 20 (19) Elytra (Fig. 82) not apically black, with irregular light spots; a blackish-brown spot on the basal part of upper edge of hind femur, outer surface unicolourous; subgenital plate and ovipositor as in Text-fig. 93, 105 ***striolata*** (Ramme)

- 21 (16) Pronotum with very weak typical pattern; metazona distinctly flattened; elytra (Text-fig. 85) extending a little beyond the middle of second tergite; hind femur with a big black spot on the basal part of upper edge; a long blackish-brown spot on the middle of outer surface; subgenital plate as in Text-fig. 96; ovipositor slender (Text-fig. 106), *grisea* (Brunner)
- 22 (15) Pronotum without typical pattern, cylindrical; elytra (Text-fig. 81) reddish-brown, with few small light spots, outer edges blackish; hind femur uniformly light brown; subgenital plate and ovipositor as in Text-figs 92, 104 *indivisa* sp. n.



FIGS. 97-108. Ovipositor. 97, *Pezodrymadusa sinuata* (Rme.), VI-VII sternites; 98, *P. uvarovi* sp. n., VI-VII sternites; 99, *P. angorensis* (Uv.), V-VII sternites; 100, *P. affinis* (Bol.); 101, *P. diffusa* (Rme.), VI-VII sternites; 102, *P. kurmana* (Rme.), VI-VII sternites; 103, *P. subinermis* sp. n.; 104, *P. indivisa* sp. n. VII sternite; 105, *P. striolata* (Rme.); 106, *P. grisea* (Rme.), VII sternite; 107, *P. magnifica* (Wern.); 108, *P. honowi* (Bol.).

1. *Pezodrymadusa magnifica* (Werner, 1901)

1901. *Drymadusa magnifica* Werner, Sitzb. mat.-nat. Cl. K. Akad. Wiss. **110** : 290.
 1922. *Drymadusa magnifica* Ebner, Acta soc. Entom. Českoslov. **20** : 2.
 1934. *Drymadusa magnifica* Uvarov, Eos, **10** : 46.

♂. Fastigium of vertex a little wider than first antennal segment. Pronotum stout; no shoulder excision; posterior margin broadly rounded with a shallow

excision in the middle; distinct median carina in the second half of metazona. Elytra longer than pronotum. Hind femur stout, relatively long. Last tergite (Text-fig. 45) with a distinct depression on the middle of appendages.

Coloration: Face brownish-white, a distinct black band between eyes; occiput dark brown; a wide black stripe behind eye. Pronotum with typical pattern, yellowish-brown; a wide yellowish-brown stripe on the lateral edge of pronotum; a big dark brown spot on the middle of lateral lobe, dark brown median stripe; metazona darker; elytra reddish-brown, laterally and apically black; first and second femora with irregular black spots; near the apical part of first and second femur a black ring; a black ring on the tympanal region; a brown ring on the apical part of first and second tibiae; hind femur with a longitudinal stripe, black spots on the outer surface and irregular black spots above the stripe, a big black spot on the basal edge and dark-smokey spot on the middle of the upper edge; irregular black spots on the middle of inner surface near upper edge; a dark brown ring near the apical part; most of tibial spines with black basal spots. Half of first and second tergites black, some irregular dark brown spots on the lateral surface of third tergite; 9th tergite laterally blackish-brown, last tergite mostly black; subgenital plate light brown.

♀. Rather stout; elytra shorter than pronotum. Coloration as in ♂, but darker.

Length of body, ♂, 26.5–27.3, ♀, 34.5–35; pronotum, ♂, 9.5–10.1, ♀, 10.2–10.5; elytra, ♂, 10.1–10.6, ♀, 9–9.4; fore femur, ♂, 8.4–8.7, ♀, 9–9.2; hind femur, ♂, 25.3–25.5, ♀, 27.1–29.2; ovipositor, 14.2–16.4 mm.

Specimens examined: Armenia, Ordubat, 1 ♀ (type) (Coll. Br.-W., Coll. Christoph); Khoi (NW. Persia, Zugmayer) (Vienna Museum); Karmalinovka distr. Nachichevan, 23.vii.17, 1 ♂, 1 ♀ (British Museum).

This species has been described by Werner from three larvae from Samos, and 1 ♀ from Ordubat, and there is no doubt that two species were confused. The Samos species was probably *Paradrymadusa ornatipennis* described by Ramme from that island (*Deut. ent. Zeitschr.* 1926 : 282). Ebner (1922) and Uvarov (1934) discussed this problem and agreed that the female from Ordubat should be regarded as the type of *magnifica* and the name *ornatipennis* becomes available for the Samos species.

I examined the female type from Ordubat and the male from Nachichevan and give here their illustrations.

Shugurov (1911, *Zapiski Novoross. Ob. Est.* 37 : 11) recorded this species from Crimea, but Miram (*Ann. Mus. Zool. Acad. Sci. Leningrad*, 1929 : 461) stated that Shugurov's description applies to *retowskii* (see p. 36). Werner's records of this species from Serai-Dagh and from between Konia and Kaisarie (=Kayseri) based on larvae (*Ann. Naturhist. Hofmus. Wien*, xx : 2) cannot be accepted (Uvarov, t.c.).

2. *Pezodrymadusa subinermis* sp. n.

♂ (type). Fastigium of vertex long, widened in the middle, narrowed to the vertex, as wide as first antennal segment. Pronotum relatively short; first sulcus very distinct, typical sulcus roundly curved a little behind the middle of pronotum; a large depression on the beginning of metazona; posterior edge very weakly rounded, lateral carina weakly indicated in the apical part of metazona. Elytra shorter than

pronotum. Hind femur stoutly built, relatively short. Subgenital plate (Text-fig. 91), with deep subacute excision, with short cylindrical styli.

General coloration dirty brown ; face light brown, blackish band between eyes ; occiput dark brown, some dark brown stripes behind antennal sockets and eyes ; pronotum with typical pattern, but its upper surface light brown and lateral lobes dark brown, two median short, parallel, black stripes on the prozona, typical sulcus distinctly brown, behind it two parallel brown median lines ; lateral edge of lobes with a wide light band, posterior margin with a narrow dark brown stripe ; elytra reddish-brown, with irregular light spots ; a very pale dark brown ring near the apical part of femora and tibiae ; hind femur with a small elongated dark brown spot on the basal upper edge, upper edge and inside of the femur slightly marbled.

♀. As ♂, but pronotum more slender ; elytra (Text-fig. 80) much shorter than pronotum. Ventral plate with very wide depression, its median carina low. Subgenital plate with acutangular excision, round which there is a depression ; ovipositor shorter than half of hind femur, its basal part stoutly built, apical part slender (Text-fig. 103).

Coloration as in ♂.

Length of body, ♂, 26.9, ♀, 27.1–28 ; pronotum, ♂, 8.1, ♀, 7.9–8 ; elytra, ♂, 7.8, ♀, 6.1–6.4 ; fore femur, ♂, 7.5, ♀, 7.9–8.1 ; hind femur, ♂, 24.9, ♀, 25.6–26.6 ; ovipositor, 12.1 mm.

Specimens examined : E. Turkey : Elazig, Sivrice, 12.vi.1952, 1 ♂ (type), 15.vi., 16.vii.1952, 2 ♀ (Ö. K. Gülen).

This new species is related to *P. konowi* (Bol.), but differs from it by being more stout and by pronotum with typical pattern which is absent in *P. konowi*, by the colour of elytra and by the shape of ♂ cercus.

3. *Pezodrymadusa konowi* (I. Bolivar, 1899)

1899. *Drymadusa konowi* I. Bolivar, *Ann. Soc. ent. Belg.* **43** : 600.

1939. *Drymadusa konowi* Rammé, *Mitt. Zool. Mus. Berlin*, **24** (1) : 68.

♂. Fastigium of vertex a little wider than first antennal segment. Pronotum cylindrical. Elytra shorter than pronotum, extending almost to the end of 2nd tergite. Appendages of last tergite (Text-fig. 47) narrow and very acute ; subgenital plate with widely rounded excision, styli cylindrical.

General coloration reddish-brown, face creamy brown ; a very distinct band between eyes ; occiput as face ; a wide black stripe behind eye ; pronotum unicolourous, pronotal lobes of some specimens have light edges ; elytra black with irregular ivory-white spots ; legs unicolourous, a large elongate black spot on the basal upper edge and a brown elongate stripe on the outer side of hind femur, inside of hind femur unicolourous ; basal part of last tergite blackish-brown.

♀. As ♂, but larger, pronotum stouter and more convex in profile. Elytra (Text-fig. 83) much shorter than pronotum, extending to the middle of 2nd tergite. Hind femur stouter. Ventral plate relatively small, with a short and stout median carina ; subgenital plate (Text-fig. 94) wider than long. Ovipositor (Text-fig. 108)

much longer than half the hind femur, its middle part narrowed, gradually down-curved.

Coloration as in ♂, first thirds of tergites blackish-brown; upper basal part of ovipositor blackish-brown.

Length of body, ♂, 25–29, ♀, 28.9–31; pronotum, ♂, 8–9, ♀, 8.5–9.4; elytra, ♂, 7.3–8, ♀, 5–7; fore femur, ♂, 7, ♀, 7.9; hind femur, ♂, 22–23, ♀, 23.8–25.2; ovipositor, 12.4–13.8 mm.

Specimens examined: S. Turkey: Maras (=Maraş), Bimbogha-Dagh (=Binbuğa dağı), 1 ♂, 1 ♀ (type) (Escalera) (Madrid Museum); Maras, 1931, 1 ♀ (E. Cold) (British Museum); Elazığ: Helezür Köyü, 16.vii.1952, 1 ♂, Elazığ: Sivrice, 9.vi.1951, 8 ♂, 23 ♀ (Ö. K. Gülen) (Zoological Institute, University of Ankara).

Ramme (1939) mentioned also 1 ♀ from Akbes in Syria.

4. *Pezodrymadusa indivisa* sp. n.

1958. *Drymadusa kurmana* Karabag, *Orthop. Faun. Turkey*: 48 (nec Ramme).

♂ (type). Slender. Fastigium of vertex almost as wide as first antennal segment, with very shallow and fine median sulcus above. Pronotum cylindrical, relatively short, posterior margin very broadly rounded; lateral carina very weak, only in metazona; shoulder excision almost absent; first sulcus distinct; typical sulcus very weak, roundly curved at the middle of pronotum. Elytra shorter than pronotum, reaching middle of 2nd tergite. Legs slender and relatively short. Appendages of last tergite as Text-fig. 48; cercus (Text-fig. 29) cylindrical, weakly incurved at the last third, its apical part acute; subgenital plate with a rounded excision, styli cylindrical, short.

General coloration light brown, face much lighter, blackish band between eyes distinct; occiput very weakly marbled; pronotum reddish-brown, without typical pattern, no blackish stripe on outer posterior margin; lateral edges of pronotal lobes with indistinct light brown stripe; elytra dark reddish-brown, with few light spots and blackish lateral edge; legs unicolourous, hind femur without black spots; tergites unicolourous.

♀. Stouter. Elytra (Text-fig. 81) much shorter than pronotum, extending a little beyond first tergite. Hind femur much stouter and longer than in ♂; VI sternite flattened, VII sternite weakly convex; ventral plate (Text-fig. 92) not very wide; subgenital plate with acutangular excision, and a longitudinal median depression; ovipositor a little longer than half the hind femur, gradually down-curved, its middle distinctly broad.

Coloration as in ♂, but a little darker; occiput distinctly marbled; pronotum dark reddish-brown; light stripe at the edge of lateral lobes more distinct. Elytra with small pale spots, and black edges. Ovipositor without dark pattern.

Length of body, ♂, 28.3, ♀, 29; pronotum, ♂, 7.7, ♀, 8.8; elytra, ♂, 6.1, ♀, 6; fore femur, ♂, 6.6, ♀, 7.4; hind femur, ♂, 23.8, ♀, 25.6; ovipositor, 13.1 mm.

Specimen examined: E. Turkey: Van, Gavaş (Gevaş) distr. Artos dag, 8,000 ft., 15.vii.1954, 1 ♂ (type), 1 ♀ (P. H. Davis).

This new species is allied to *P. kurmana* Ramme, but differs from it by the colour of occiput, pronotum and elytra, shape of cercus and titillator, colour of hind femur and structure of ovipositor.

5. *Pezodrymadusa kurmana* (Ramme, 1939)

1939. *Drymadusa kurmana* Ramme, *Mitt. Zool. Mus. Berlin*, **24** (1) : 69.

1951. *Drymadusa kurmana* Ramme, *Mitt. Zool. Mus. Berlin*, **27** : 358.

♂. Fastigium of vertex a little wider than first antennal segment, with a short and distinct median sulcus. Pronotum cylindrical, relatively small; its posterior edge very broadly rounded; lateral carina rounded, but distinct in metazona; first sulcus distinct; typical sulcus roundly curved a little behind the middle of pronotum; shoulder excision almost absent. Elytra shorter than pronotum, extending a little beyond 2nd tergite. Hind femur short. Appendages of last tergite (Text-fig. 49) slightly (in some specimens strongly) divergent; cercus cylindrical, very weakly incurved in last third (Text-fig. 30); subgenital plate with wide round excision, styli very short.

General coloration ochre-brown; face light brown; black band between eyes very distinct; occiput blackish-brown; two wide blackish-brown stripes behind eye; upper surface of pronotum black or blackish-brown, except wide posterior edge; posterior margin with a narrow blackish-brown edge; lateral lobes light reddish-brown, with a light creamy posterior edge; elytra reddish-blackish-brown, apical part blackish-brown, with irregular round light spots; femora near apex with a very pale dark brown ring; or with long blackish-brown spot on the basal upper edge of hind femur, a long dark brown stripe on inner and outer sides; tergites unicolourous, only apical edges dark brown.

♀. Pronotum more convex in profile than in ♂. Elytra (Text-fig. 79) much shorter than pronotum, extending to the middle of 2nd tergite. Hind femur longer, and stouter; VI sternite distinctly convex, ventral plate wide; subgenital plate wider than long, with a deep acutangular excision (Text-fig. 90); ovipositor a little longer than half the hind femur, stout, not widened in the middle (Text-fig. 102).

Coloration as in ♂, but darker; basal upper edge of ovipositor blackish.

Length of body: ♂, 25–25.8, ♀, 27–27.2; pronotum, ♂, 7.1–7.6, ♀, 8–8.4; elytra, ♂, 5.7–6.7, ♀, 5.7–5.9; fore femur, ♂, 6.5–6.7, ♀, 7.6; hind femur, ♂, 22–22.9, ♀, 24.6–25.2, ovipositor, 12.1–13 mm.

Specimens examined: SE. Turkey: Malatya Mountains near Yukaribanassiya (=Yukaribanazi), 1,100–1,600 m., 6 and 7.vii.37, ♂ (*type*), ♀ (W. Ramme) (Berlin Museum), 1 ♂ (British Museum).

6. *Pezodrymadusa lata* sp. n.

♂ (*type*). Fastigium of vertex a little wider than first antennal segment, with a distinct median sulcus. Pronotum cylindrical, its posterior margin broadly rounded, lateral carina distinct in the last half of metazona; first sulcus distinct, typical sulcus roundly curved behind middle of pronotum. Elytra almost as long as pronotum, extending to the end of 2nd tergite. Legs slender; hind femur relatively short

and not very stout. Appendages of last tergite (Text-fig. 50) divergent, cercus cylindrical, slightly incurved, with acute apical spine; subgenital plate with widely rounded excision, styli cylindrical and very short.

General coloration greyish-brown, face greyish-white; black band between eyes; first antennal segment dark brown; occiput grey; two longitudinal parallel blackish stripes near the middle; pronotum grey, without typical pattern, lateral edges of pronotal lobes creamy; black spot on the lateral corner of metazona; elytra brown, with a large elongated whitish spot on the posterior edge, and some small irregular light spots; anterior edge darker. Upper surface of femora a little darker than the lower; hind femur without black or dark brown spots. Tergites marbled; subgenital plate creamy.

Length of body, 28; pronotum, 7.9; elytra, 7.8; fore femur, 7.1; hind femur, 25.1 mm.

Specimen examined: E. Turkey: Bingöl, Karlioğlu, Kürük Köyü, 6.viii.1954, 1 ♂ (type) (N. Şişli).

This new species is allied to *P. kurmana* but differs from it by colour of pronotum, longer elytra, with elongate whitish spot on their posterior edge; absence of black spot on the basal upper edge of hind femur, and by the structure of cercus and titillator.

7. *Pezodryadusa uvarovi* sp. n.

♂ (type). Fastigium of vertex a little wider than first antennal segment, with very shallow median sulcus. Pronotum cylindrical, relatively short; its posterior edge broadly rounded; lateral carina very weak at the corner of metazona; first sulcus distinct; typical sulcus roundly curved behind middle of pronotum. Elytra longer than pronotum, extending to the end of 3rd tergite; hind femur short and stout. Appendages of last tergite long, spine-like, divergent (Text-fig. 51); cercus stout (Text-fig. 32); titillator stout (Text-fig. 62); subgenital plate longer than wide, with acutangular excision, styli cylindrical, small.

General coloration light brown, or greyish-brown; face dirty light brown; black band between eyes very distinct; outer sides of first and second segment of antenna black; surrounding the eye black; occiput of ground colour, without pattern; pronotum light brown, lateral edges of pronotal lobes lighter, posterior margin of pronotum reddish-brown; elytron reddish-brown, with irregular creamy spots; basal parts of femoral spines black, near the apices of femora dark brown ring; large elongated black spot on the basal upper edge and a longitudinal black spot, widening apically, a small elongate black spot near upper edge of inside of hind femur; apical edge of V-VIIIth tergites dark brown (in other specimens pale striped with reddish-brown).

♀. Pronotum more slender, elongate and more convex in profile; its posterior margin more broadly rounded (some specimens have a weak median carina on the last half of metazona). Elytra (Text-fig. 75) shorter than pronotum. Subgenital plate longer than wide, with acutangular excision; ovipositor longer than half of

hind femur, slender, its upper edge almost straight, lower edge regularly down-curved (Text-fig. 98).

Coloration as in ♂, but a little darker, elytra darker, with a large elongate whitish spot near the inner edge and some small light spots in the middle.

Length of body, ♂, 27 (type)—32.4, ♀, 30–31.5; pronotum, ♂, 8.1 (type), ♀, 9–10.1; elytra, ♂, 9.2 (type), ♀, 6.2–8.1; fore femur, ♂, 7–8.2 (type), ♀, 8.3–9.1; hind femur, ♂, 26 (type), ♀, 25.3–26.9; ovipositor, 15 mm.

Specimen examined: E. Turkey: Tunceli, Nazimiye, 8.vii.1952, 4 ♂ (including type), 2 ♀ (Ö. K. Gülen).

I have much pleasure in dedicating this new species to Dr. B. P. Uvarov, who has done outstanding work on Orthoptera.

This new species differs from others by the structure of cercus and titillator of ♂, and by tubercle on the VIth sternite of ♀.

8. *Pezodrymadusa sinuata* (Ramme, 1951)

1951. *Drymadusa sinuata* Ramme, *Mitt. Zool. Mus. Berlin*, **27**: 357.

♂. Pronotum cylindrical, rather elongate, posterior margin almost semicircular; lateral carina very weak at the corner of metazona. Elytra extending to the end of 2nd tergite.

Face light; dark brown band between eyes; pronotum with distinct typical pattern, and broad blackish median stripe; elytra reddish-brown, without light spots, a dark brown ring near the apical part of femora; hind femur with a big dark spot on the basal upper edge.

♀ (type). Fastigium of vertex almost as wide as first antennal segment, with a median sulcus. Pronotum more elongate, cylindrical, posterior edge almost semicircular; a weak median carina on the last half of metazona; pro- and metazona of lateral lobes with a wide convexity. Elytra (Text-fig. 74) shorter than pronotum. Appendages of anal tergite long (Text-fig. 52); ovipositor long, gradually down-curved (Text-fig. 97).

General coloration light brown, face whitish-brown, a dark brown band between eyes; elytra with light irregular spots.

Length of body, ♂, ♀, 32.7; pronotum, ♂, 8, ♀, 10; elytra, ♂, 9, ♀, 7.5; hind femur, ♂, 21, ♀, 26; ovipositor, 18.6 mm.

Specimens examined: E. Turkey: Sivas, Kizil Dag (between Süşehri and Zara), 1930, 1 ♀ (type) (Şevket Tuncok); Sivas, vii. 1934, 1 ♂ (Rosenbohm) (Berlin Museum).

Ramme (1951) described the species from a single ♀. The female characters are very good; the tubercle of VI and VIIth sternites and the length of ovipositor separate this species from *P. striolata*. The male from Sivas is in very bad condition, large part of abdomen and titillator being absent; only the right cercus present and it is similar to that of *P. striolata*, though a little different from it. Until more specimens are available it is still doubtful whether the male belongs to *P. sinuata* or *P. striolata*.

9. *Pezodrymadusa grisea* (Brunner-Wattenwyl, 1882)

1882. *Drymadusa grisea* Brunner-Wattenwyl, *Prodr. eur. Orthopt.* : 315.

♂. Fastigium of vertex wider than first antennal segment, with a shallow median sulcus. Pronotum with weakly convex prozona and flattened metazona; lateral carina distinct in metazona; its posterior margin almost straight; first sulcus very distinct; typical sulcus roundly curved before the middle of pronotum; no shoulder excision. Elytra longer than pronotum. Hind femur relatively short, but stout. Subgenital plate longer than wide, with a deep and acutangular excision, styli short.

Face lighter and unicolourous; black band between eyes very distinct; outer surface of first and second segments of antenna blackish; black postocular stripe with a white spot just behind; occiput brown, a black median stripe on the pronotum, lateral edge of pronotal lobes lighter, lateral corner of metazona and middle of its posterior margin black. Elytra reddish-brown, without light spots. A dark brown ring near the apices of femora, a blackish-brown ring near the base of upper edge of hind femur, a black stripe along the middle of outer surface and a blackish-brown stripe on the lower edge of hind femur. Second half of I, II and III tergites blackish, the rest of them laterally with short transverse black stripes.

♀. Pronotum more slender; elytra (Text-fig. 85) shorter than pronotum. Ovipositor (Text-fig. 106) slender, longer than half of hind femur, its upper edge almost straight, lower edge regularly down-curved.

Coloration as in ♂.

Length of body, ♂, 26.4–30, ♀, 25.2–26.2; pronotum, ♂, 8.3–9.2, ♀, 8.2–9; elytra, ♂, 12, ♀, 7.2–8.6; fore femur, ♂, 7.7–8.1, ♀, 7.1–7.8; hind femur, ♂, 23–26, ♀, 22.2–23.1; ovipositor, 16–16.4 mm.

Specimens examined: Iran: Hadschyabad, 1 ♂ (type), 1 ♀ (Coll. Br. V. W., ex. Coll. Lederer), 8170 (Vienna Museum); Tal von Kamrud (Mazand.), 17–2,000 m., 23.vi., 1 ♂ (Coll. P. Aellen, 1948), 1950–615; Shahrud (NE. Persia), 30.v.914, 1 ♀ (Kiritshenko) (British Museum).

The structure of pronotum, the shape and length of ovipositor in this species are reminiscent of *Paradrymadusa*, but other characters are as in *Pezodrymadusa*.

10. *Pezodrymadusa diffusa* (Ramme, 1951)

1951. *Drymadusa diffusa* Ramme, *Mitt. Zool. Mus. Berlin*, 27 : 356.

♂. Face whitish-grey, dark brown band between eyes. Posterior edge of pronotum almost straight, greyish-brown marbled. Elytra shorter than pronotum, blackish-brown, with some oval spots. Femora greyish-brown.

♀ (type). Elytra (Text-fig. 78) shorter than pronotum. Ovipositor longer than half of hind femur, stout, regularly down-curved (Text-fig. 101).

Length of body, ♂, 24.5, ♀, 29; pronotum, ♂, 9.2, ♀, 9.3; elytra, ♂, 8, ♀, 6.7; hind femur, ♂, 22.1, ♀, 22.4; ovipositor, 13.8 mm.

Specimens examined: S. Turkey: Ulukışla, 1,400–1,600 m., 17.vii.1937, 1 ♀ (type) (W. Ramme); Dümbelek Dagħ, 1 ♂ allotype, (Collector ?) (Berlin Museum).

This species is very similar to *P. striolata* in the shape of cercus and ovipositor, differing mainly by colour and especially by the typical pattern of pronotum.

The last tergite of the ♂ is much damaged, and the titillator is absent. The species will remain doubtful, until more specimens are available.

11. *Pezodrymadusa striolata* (Ramme, 1951)

1951. *Drymadusa striolata* Ramme, *Mitt. Zool. Mus. Berlin*, 27 : 355.

♂. Elytra a little shorter than pronotum, extending nearly to the end of third tergite. Subgenital plate almost as long as wide.

♀. Elytra (Text-fig. 82) extending to the middle of second tergite, shorter than pronotum. Ovipositor (Text-fig. 105) longer than half of hind femur.

Face whitish-brown, a big brown spot on the occiput ; black band between eyes ; black stripe behind eye ; two fine black and parallel median lines on the pronotum ; transverse blackish spot on the metazona ; yellowish-brown transverse band near posterior edge of metazona. Elytra dirty brown, with some light spots. Abdomen and legs uniformly brown.

Length of body, ♂, 30.6, ♀, 32.2 ; pronotum, ♂, 9.1, ♀, 9.9 ; elytra, ♂, 9, ♀, 7.2 ; hind femur, ♂, 22.1, ♀, 23 ; ovipositor, 13 mm.

Specimens examined : S. Turkey : Nigde, Ütsch Kapular (=Üçkapular) Daglı, 18, 21 and 24.vii.1937, 1 ♂ (type), 1 ♀ (paratype) (W. Ramme) (Berlin Museum).

12. *Pezodrymadusa angorensis* (Uvarov, 1930)

1930. *Drymadusa angorensis* Uvarov, *Eos*, 6 : 353.

♂. Metazona short, weakly convex ; shoulder excision weak, rounded. Elytra reaching the apex of the third tergite. Subgenital plate obtusely excised behind.

General coloration pale brown (some specimens light brown with dark brown pattern). Face uniformly pale (in some specimens light creamy) ; black fascia between eyes ; black line on the middle of metazona extending to its end ; indistinct typical pattern on the pronotum (in some specimens very distinct) ; (some specimens have light edge of lateral pronotal lobes) ; elytra with brownish (some specimens greenish-creamy) with lighter spots. A pale brown ring near the apices of femora ; a blackish-brown spot on the upper basal edge of hind femur. Tergites with blackish design (some specimens with blackish-brown and whitish spots on the tergites).

♀. Robust. Pronotum stout ; elytra (Text-fig. 76), reaching middle of second tergite. Subgenital plate with acutangular excision, surrounded by a depression ; ovipositor (Text-fig. 99) very stout, regularly down-curved.

Coloration darker than in ♂, typical pattern on the pronotum very distinct.

Length of body, ♂, 31–32.5, ♀, 33.1–36.6 ; pronotum, ♂, 9–10, ♀, 9.8–10.9 ; elytra, ♂, 8.2–10, ♀, 7.4 ; fore femur, ♂, 7.1–7.8, ♀, 8.9 ; hind femur, ♂, 22.8–23.7, ♀, 25.1–27.6 ; ovipositor, 13.8–14.3 mm.

Specimens examined: Turkey: Ankara, Beypazari, 1 ♂ (type) (Sureya Bey); Asia Minor: between Ankara and Changri (=Çankiri), Kai-Dagh, 10.vii.1931, 2 ♀ (B. P. Uvarov) (British Museum); Ankara: Etlik, 19.vii.1939, 1 ♂, 2 ♀; Ayaşbeli, 11.vii.1939, 1 ♂, 1 ♀; Hacikadin deresi, 22.vi.1948; 1 ♂ (T. Karabag) (Zoological Institute, University of Ankara); Hasanoglan, 130 km., from Ankara, 8.vii.1959, 1 ♀ (K. Guichard) (British Museum).

Ramme (1951) recorded this species from Ankara, Emir-Göl, 1936, 1 ♀ (M. Tolunay).

13. *Pezodryadusa affinis* (I. Bolivar, 1899)

1899. *Dryadusa affinis* I. Bolivar, *Ann. Soc. ent. Belg.* **431**: 601.

♀. Pro- and metazona of pronotum convex, metazona weakly flattened; shoulder excision shallow; posterior edge of pronotum very broadly rounded. Elytra (Text-fig. 77) very small, extending to the end of first tergite. Hind femur relatively short, slender. Ovipositor (Text-fig. 100) relatively short, regularly down-curved.

General coloration light brown, face unicolourous (but a dark brown band on the face); dark brown fascia between eyes distinct; longitudinal brown stripe behind eye; typical pronotal pattern distinct, a longitudinal median dark brown stripe on the pronotum; elytra dark brown, with irregular light spots; legs light brown, a big blackish-brown spot on the basal upper edge of hind femur.

Length of body, 30–30.8; pronotum, 9.8; elytra, 5; fore femur, 8–9.1; hind femur, 24.9–25.1; ovipositor, 12.4–13 mm.

Specimens examined: S. Turkey: Bimbogha-Dagh (=Binbuğa dağı), 1 ♀ (type) (Escalera) (Mus. Madrid); Ütch-Kapular Dag (=Üçkapular dağı), Nigde, S. Anatolia, 900–1,400 m., 18., 21. and 28.vii.1937, 1 ♀ (W. Ramme) (British Museum).

Ramme (1951) discussed this species, and compared it with *P. angorensis*.

Bolivar described this species from a single female. Abdomen of the type is in bad condition, and Text-fig. 100 is that of a female from Ütch-Kapular Dag, determined by Ramme. Until more specimens of both sexes are obtained the status of this species will be uncertain.

IV. *ANADRYADUSA* gen. n.

Type: *Dryadusa spinicercis* (Karabag, 1956).

Fastigium of vertex with fine median sulcus. A black transverse fascia between eyes. First sulcus of pronotum distinct, typical sulcus almost in the middle of pronotum; a transverse depression behind the typical sulcus; median carina absent or very weak. Elytra fully developed (except *A. brevipennis*, *A. retowskii*, *A. ornaticornis*, *A. albomaculata*).

♂. Appendages of last tergite long, spine-like (except *A. adzharica*). Cercus mostly very long and with enlarged basal articulation. Subgenital plate with deep roundly-angular excision.

♀. Last tergite with long spine-like appendages. Between VII sternite and subgenital plate there is a bi-concave ventral plate (except *A. retowskii*). Subgenital plate with a deep acutangular or subacute excision. Ovipositor very long, almost straight or slightly down-curved.

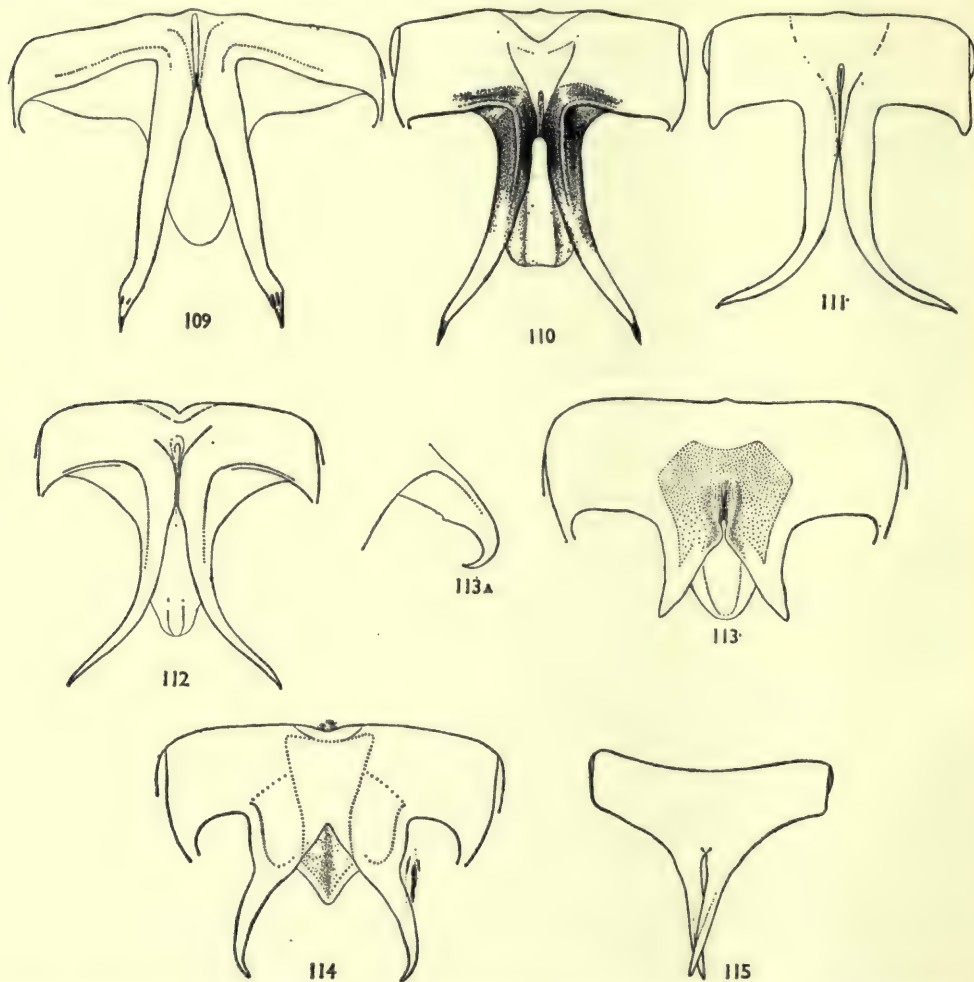
DISTRIBUTION. Greek islands (Syra and Samos); Turkey; Caucasus; Iran and Crimea.

Three species: *retowskii*, *adzhарica* and *ornatipennis* are included in this genus with some hesitation.

KEY TO SPECIES

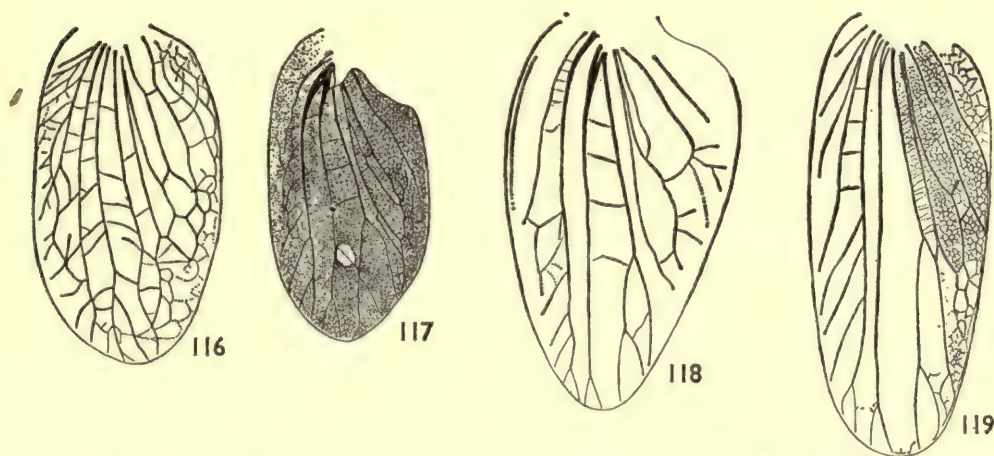
Male

- 1 (8) Appendages of last tergite very long, spine-like and strongly divergent (Text-figs. 109-111).



FIGS. 109-115. ♂ last tergite. 109, *Anadrymadusa brevipennis* (Br.-W.); 110, *A. spinicercis* (Karab.); 111, *A. recticauda* (Wern.); 112, *A. curvicercis* (Uv.); 113, *A. adzhарica* (Uv.); 113A, apical part of last tergite in profile; 114, *A. retowskii* (Adel.); 115, *A. ornatipennis* (Rme.).

- 2 (3) Elytra shorter than pronotum; last tergite very narrow, its appendages swollen near apices, with a long and strong apical tooth (Text-fig. 109); cercus very long, rectangularly curved, length of its apical part almost equal to the basal part, with a long and strong apical tooth (Text-fig. 42); basal branches of titillator narrow, median branches compressed laterally, with a double line of strong numerous spines (Text-fig. 66) 1. *brevipennis* (Br.-W.)
- 3 (2) Elytra much longer than pronotum (or much longer than abdomen); last tergite not very narrow.
- 4 (5) External margin of wings infumate; IX tergite with acutangular projection, appendages of last tergite as Text-fig. 112; cercus very long, slender, strongly upcurved, its apical part much longer than basal, with a small apical tooth (Text-fig. 43); basal branches of titillator fused, median branches with strong spines (Text-fig. 67) 2. *curvicercis* (Uvarov)
- 5 (4) External margin of wings not infumate; IX tergite without a median acutangular projection.



FIGS. 116-119. ♀ left elytra. 116, *Anadrymadusa brevipennis* (Br.-W.); 117, *A. retowskii* (Adel); 118, *A. ornatipennis* (Rme.); 119, *A. albomaculata* (Karab.).

- 6 (7) Elytra much longer than abdomen; appendages of last tergite strongly divergent, but apically incurved (Text-fig. 110); cercus conical, with a large tooth before the apex (Text-fig. 38); basal branches of titillator as in Text-fig. 68, median branches covered with dense teeth 3. *spinicercis* (Karabag)
- 7 (6) Elytra shorter or a little longer than abdomen; appendages of last tergite strongly divergent behind middle (Text-fig. 111); cercus obtusangularly incurved with a distinct convexity near its middle and a strong apical tooth (Text-fig. 44); basal branches of titillator slender, median branches with a line of strong teeth (Text-fig. 69) 4. *recticauda* (Werner)
- 8 (1) Appendages of last tergite not very long, down-curved, incurved, or straight (Text-figs. 113-115).
- 9 (10) Elytra shorter than pronotum; appendages of last tergite incurved in half circle (Text-fig. 114); cercus upcurved also in half circle (Text-fig. 40); titillator small and very slender, median branches with few spines (Text-fig. 71) 5. *retowskii* (Adelung)
- 10 (9) Elytra longer than pronotum; appendages of last tergite divergent or straight (Text-fig. 113, 115); cercus slightly or strongly incurved (Text-fig. 41, 42); titillator stout (Text-figs. 70, 72).

- 11 (12) Appendages of last tergite strongly decurved (Text-figs. 113, 113A); cercus slightly incurved, with a distinct swelling at the last third of inside, and a strong apical tooth (Text-fig. 41), median branches of titillator with strong teeth (Text-fig. 70) 6. *adzharica* (Uvarov)
- 12 (11) Appendages of last tergite straight (Text-fig. 115); cercus strongly incurved, with a distinct knee at the last third and a strong apical tooth (Text-fig. 42); median branches of titillator long, with large teeth at the median line (Text-fig. 72) 7. *ornatipennis* (Ramme.)

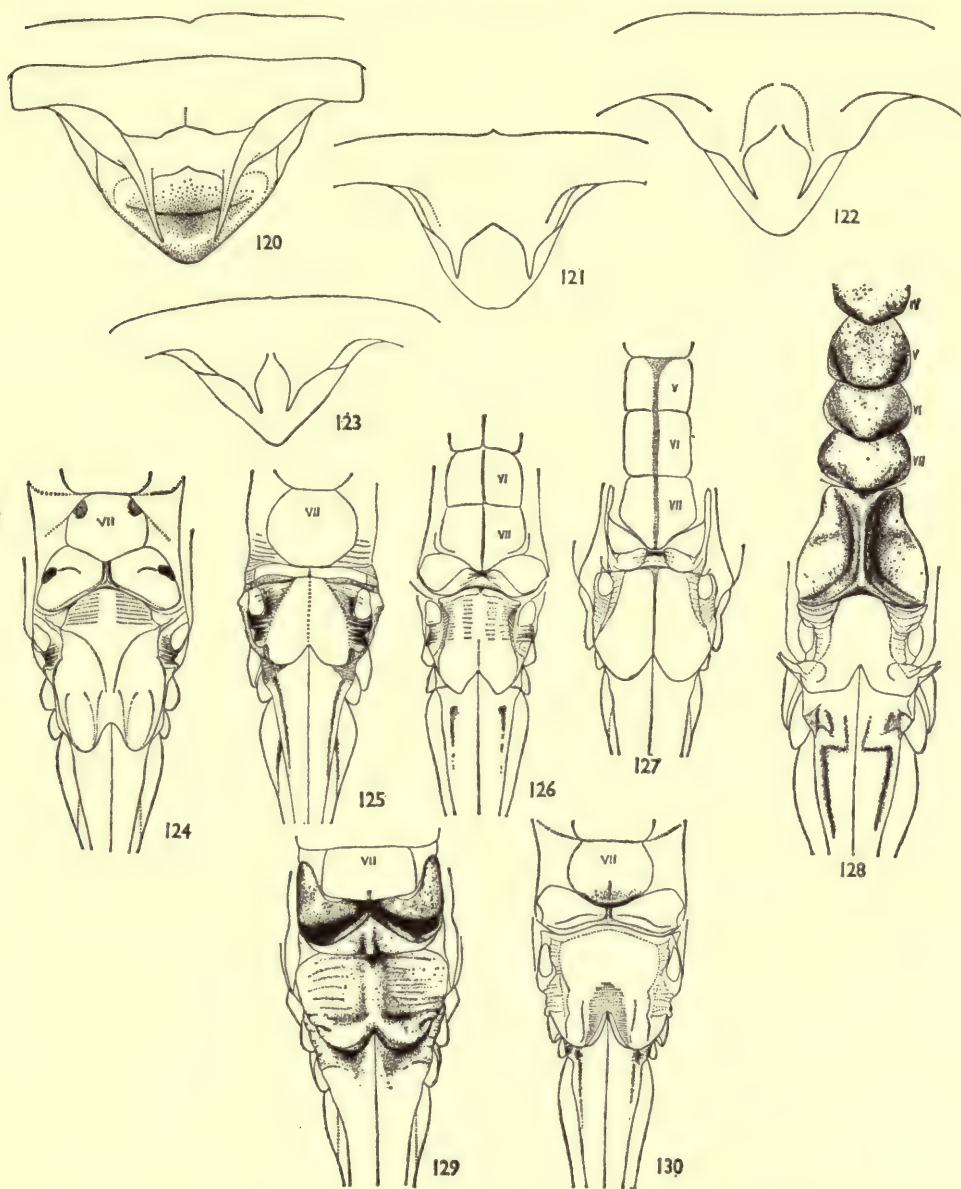
Females

- 1 (8) Elytra longer than half of body.
- 2 (3) External margin of wings distinctly infumate; IV-VII sternites convex posteriorly; bi-concave ventral plate longer than subgenital plate, with a large median carina; lobes of subgenital plate with straight apical edge (Text-fig. 128) *curvicercis* (Uvarov)
- 3 (2) External margin of wings not infumate.
- 4 (5) Elytra extend beyond the hind knee; bi-concave ventral plate much shorter than subgenital plate, its median carina short; subgenital plate much longer than wide (Text-fig. 124) *spinicercis* (Karabag)
- 5 (4) Elytra do not reach the hind knee.
- 6 (7) V sternite without two swellings; VII sternite strongly convex in the apical part; bi-concave ventral plate much shorter than subgenital plate; subgenital plate longer than wide (Text-fig. 130); ovipositor longer than $2\frac{1}{2}$ times the pronotum, straight *recticauda* (Werner)
- 7 (6) V sternite with two swellings posteriorly; VII sternite very narrow with a low convexity; ovipositor shorter than $2\frac{1}{2}$ times the pronotum, its upper edge straight, lower edge slightly concave *adzharica* (Uvarov)
- 8 (1) Elytra shorter than half of body.
- 9 (12) Elytra equal to or longer than pronotum.
- 10 (11) Elytra as in Text-fig. 119; appendages of last tergite long (Text-fig. 123); V-VII sternites with a shallow median furrow, subgenital plate with a weak furrow in the apical half (Text-fig. 126) *albomaculata* (Karabag)
- 11 (10) Elytra as in Text-fig. 118; appendages of last tergite short, V-VII sternites with a very distinct and wide median furrow; subgenital plate with a very distinct median furrow (Text-fig. 127) *ornatipennis* (Ramme)
- 12 (9) Elytra shorter than pronotum.
- 13 (14) Bi-concave ventral plate present, subgenital plate with median and apical swelling (Text-fig. 129); ovipositor stout and straight *brevipennis* (Brunner)
- 14 (13) Ventral plate not bi-concave but a single transverse shiny structure; subgenital plate with a weak median carina (Text-fig. 125); ovipositor slightly down-curved *retowskii* (Adelung)

1. *Anadrymadusa brevipennis* (Br.-W., 1882)

1882. *Drymadusa brevipennis* Brunner-Wattenwyl, *Prodr. eur. Orthopt.*: 314, 315.

Pronotum robust, its posterior edge rounded, first sulcus distinct, typical sulcus very weak, roundly curved nearly at the middle of pronotum. ♂ subgenital plate longer than wide, with rounded shallow excision, styli long and slender. ♀ elytra as in Text-fig. 116.



FIGS. 120-130. ♀. 120, *Anadrymadusa curvicercis* (Uv.), appendages of last tergite; 121, *A. spinicercis* (Karab.), ditto; 122, *A. recticauda* (Wern.); 123, *A. albomaculata* (Karab.), ditto. 124-130, bi-concave plate, subgenital plate and basis of ovipositor. 124, *A. spinicercis* (Karab.), VII sternite; 125, *A. retowskii* (Adel.), VII sternite; 126, *A. albomaculata* (Karab.), VI-VII sternites; 127, *A. ornatipennis* (Rme.), V-VII sternites; 128, *A. curvicercis* (Uv.), IV-VII sternite; 129, *A. brevipennis* (Br.-W.), VII sternite; 130, *A. recticauda* (Wern.), VII sternite.

General coloration reddish-brown, face unicolourous, typical fascia between eyes indistinct, some brown spots behind eyes, a long and narrow black spot on the lateral side of metazona.

♂ hind femur with some blackish-brown short stripes in two lines on the basal upper edge, ♀ with smaller blackish-brown spots on the basal upper edge of hind femur.

Length of body, ♂, 31.4–34, ♀, 36–38.4; pronotum, ♂, 11, ♀, 11–11.8; elytra, ♂, 9–10, ♀, 9–9.3; fore femur, ♂, 9–9.1, ♀, 9.6–9.9; hind femur, ♂, 26–28, ♀, 29–30.1; ovipositor, 21.5–22.4 mm.

Specimens examined: Greek islands: Syra, 2 ♂, 2 ♀ (Coll. Br.) (Mus. Vienna).

Ramme recorded this species also from the islands of Kea, Kythnos, Polivos, Andros, Paros, Antiparos, Amorgas and Skyros, but did not mention where the specimens are. It would be of interest to examine them, since some of them may be different species or subspecies.

2. *Anadrymadusa curvicercis* (Uv., 1916)

1916. *Drymadusa curvicercis* Uvarov, *Bull. Mus. Caucasus*, X: 8.

1951. *Drymadusa curvicercis* Ramme, *Mitt. Zool. Mus. Berlin*, 27: 352 (Partim).

Fastigium of vertex elongate, prominent forward, with distinct median sulcus. Pronotum relatively short, laterally depressed; its posterior edge rounded; with a distinct transverse depression behind the typical sulcus; first sulcus very distinct; typical sulcus distinct, roundly curved behind middle of pronotum.

♂. Elytra extend beyond hind knee. Hind femur relatively short, but stout. Subgenital plate much longer than wide, with conical styli.

♀. Elytra extend a little beyond the hind knee; hind femur more stout than in ♂; cercus long and regularly incurved, its apex pointed (acute) appendages of last tergite (Text-fig. 120) very long and spine-like. Ovipositor much longer than half of hind femur, stout, very slightly down-curved, regularly narrowing to apex.

Coloration testaceous-reddish-brown; face uniformly reddish-creamy; black fascia between eyes, orbits of eyes black; blackish stripe behind eye. Typical pattern of pronotum distinct; blackish big spot on the lateral lobes, reddish-creamy stripe on the lateral edge of lateral lobes; longitudinal median black stripe on the disc; elytra testaceous, with irregular whitish and small dark brown spots; hind femur marbled.

♀ lighter than ♂, smoky fascia of wings darker than in ♂; legs light brown.

Length of body, ♂, 40, ♀, 42; pronotum, ♂, 9.7, ♀, 11.2; elytra, ♂, 40.5, ♀, 45.1; fore femur, ♂, 10, ♀, 12; hind femur, ♂, 35.2, ♀, 39; ovipositor, 28.3 mm.

Specimens examined: Iran: Bakhtiaria, Radjoh-Tchal Tcharaneh, viii. 1950, 1 ♂, 1 ♀ (Hakim) (Mus. Leningrad).

Uvarov described this species from Kurdistan: Biare and Šenie 3 ♂, 2 ♀ (P. Nesterov). This beautiful insect looks superficially like *Ceraecercus*, but differs from it especially by ♂ cercus and bi-concave ventral plate of ♀.

3. *Anadrymadusa spinicercis* (Karabag, 1956)

1956. *Dryadusa spinicercis* Karabag, *Comm. Fac. Sci. Ankara*, Serie C, 5 : 7.

♂. Fastigium of vertex a little wider than first antennal segment. Pro- and meso-zona of pronotum weakly convex; metazona flattened, with median carina on metazona; first sulcus distinct; typical sulcus curved in angle behind middle of pronotum. Elytra well developed, wings very broad, semicircular.

Coloration brown, face lighter, unicolourous; frons with complete black band between eyes, which continues behind them; pronotum above with typical pattern; large blackish-brown spot on the lateral lobe of pronotum; elytra with a series of round whitish spots and smaller white markings. A blackish-brown ring near the apex of femora, hind femur with a dark brown spot on the basal edge of upper edge, irregular pale brown spots and stripes on the outer surface.

♀. Median carina very weak on metazona. Hind femur very strong. Appendages of last tergite (Text-fig. 121) long and spine-like, almost parallel. Subgenital plate large, with a deep subacute excision, its lobes concave; ovipositor much longer than half of hind femur.

Coloration as in ♂.

Length of body, ♂, 39.2–40.5, ♀, 41–42; pronotum, ♂, 10–11, ♀, 10.2–12; elytra, ♂, 41–42, ♀, 49–52.5; fore femur, ♂, 11.8, ♀, 13.2; hind femur, ♂, 38–40, ♀, 38.9–42.4; ovipositor, 30 mm.

Specimens examined: SW. Turkey; Denizli province: Çal, Üçbaş Köyü 23.vi.1952, 2 ♂ (including type), 2 ♀ (British Museum); Hatay—S. Turkey—Yayla dağı, Yukar Tingir Köyü, 28.vi.1952, 1 ♀, Mersin: Çevlik Köyü, 2.vii.1952, 1 ♂; Antalya-Alaiye 16.viii.1952, 1 ♀ (Ö. K. Gülen) (Zool. Inst. Univ. of Ankara).

4. *Anadrymadusa recticauda* (Werner, 1903)

1903. *Dryadusa recticauda* Werner, *Zool. Anz.* 26 : 530.

1939. *Dryadusa recticauda* Ramme, *Mitt. Zool. Mus. Berlin*, 24 : 65.

1951. *Dryadusa recticauda* Ramme, *Mitt. Zool. Mus. Berlin*, 27 : 252.

♂. Fastigium of vertex wider than first antennal segment, suddenly narrowed in front, with distinct median sulcus. Pronotum stout, posterior edge broadly rounded, lateral lobes longer than wide; first sulcus very distinct; typical sulcus acutely curved behind the middle of pronotum, a weak median carina on metazona, lateral carina distinct in metazona; shoulder excision distinct. Elytra reaching end of abdomen (in some specimens much longer). Hind femur relatively stout, subgenital plate longer than wide, with a deep roundly-angular excision, styli long and cylindrical.

General coloration dirty brown; face uniformly light brown; black band between eyes distinct; blackish-brown band behind eye; occiput dirty brown; pronotum with very weak typical pattern, its upper surface until upper half of lateral lobes dark brown, lower half light brown; black median stripe on the metazona; black spot on the corner of shoulder excision. Elytra dirty brown, with irregular whitish-brown round spots in a line along the middle; a dark brown ring near the apical part

of fore and mid femora ; short transverse black stripes on the upper edge near base of hind femur ; outer surface of hind femur marbled.

♀. Elytra reaching end of abdomen, or a little beyond it (in some specimens much longer) ; appendages of last tergite (Text-fig. 122) long. Hind femur stouter than in ♂ ; ovipositor nearly as long as hind femur.

Coloration as in ♂, but typical pattern of pronotum more distinct.

Length of body, ♂, 38.2-42, ♀, 37.2-44 ; pronotum, ♂, 10.5-11.9, ♀, 10.9-12.1 ; elytra, ♂, 25.7-37.1, ♀, 26.1-39.3 ; fore femur, ♂, 11.5-12.1, ♀, 11.3-12.2 ; hind femur, ♂, 37-40.1, ♀, 38.1-41.2 ; ovipositor, 32-36 mm.

Specimens examined : S. Turkey, Adana, 1904, 1 ♂, 1 ♀ (Ramme det.) (Berlin Mus.) ; Mersin, 22.vii.1952, 1 ♂, 2 ♀ ; Hatay, Yayladagi, Yukaritingir Köyü, 28.vi.1952, 1 ♂, Tarsus, Açikova Köyü, 25.vii.1952, 1 ♀ (Ö. K. Gülen) (Zoolog. Inst. Univ. of Ankara) ; Maraş-Göksun, 18.vii.1951, 1 ♂, 1 ♀ (Ö. K. Gülen), (Brit. Mus.) ; Mersin, 22.vii.1952, 1 ♂, 2 ♀ (Ö. K. Gülen) (Zoolog. Inst. Univ. of Ankara).

Werner described this species from a single female from Afiun-Karahissar (=Afyonkarahisar) (leg. Forgetto), but the type is missing. He also recorded 1 ♀ from Latakia, N. Syria, which I have not seen. Ramme (1939, 1951) gave a description based on ♂ and ♀ from Adana, which I have examined. My illustrations are of ♂ from Mersin and ♀ from Adana. Until ♂ and ♀ specimens from Afiun-Karahissar (=Afyonkarahisar) are studied, one cannot be quite certain whether my interpretation of the species is correct.

Adelung (*Hor. Soc. ent. Ross.*, 1907 : 72) recorded 1 ♂ larva from Bortsch'cha (NE. Turkey) and 1 ♀ larva from Singot (Batum), but such records are obviously doubtful.

5. *Anadrymadusa retowskii* (Adelung, 1907)

1907. *Paradrymadusa retowskii* Adelung, *Ann. Mus. Zool. St. Petersb.* 12 : 403.

1929. *Drymadusa retowskii* Miram, *Ann. Mus. Zool. Ac. Sci. U.R.S.S.* : 461.

♂. Fastigium of vertex a little narrower than first antennal segment, with fine median sulcus. Pronotum of the same width throughout ; posterior edge broadly rounded ; metazona flattened, first sulcus distinct, typical sulcus roundly curved a little behind middle of pronotum ; no median carina ; lateral carina distinct at the metazona ; transverse depression behind typical sulcus distinct ; shoulder excision shallow.

Elytra reaching a little beyond second tergite. Hind femur relatively short. Appendages of last tergite down-curved, apically spine-like, very acute ; a wide depression in the middle of last tergite. Subgenital plate with a deep subacute excision.

General coloration light brown (some specimens dirty brown) ; face uniformly whitish-brown, black band between eyes ; occiput very weakly marbled ; pronotum with typical pattern ; a longitudinal creamy spot on the posterior edge of lateral lobe and blackish spot over it ; elytra dark brown, with a series of round light spots, and a few small irregular spots ; hind femur marbled on the upper half, light brown in the lower half ; apical part of appendages of last tergite reddish-brown.

♀. Elytra as in Text-fig. 117. Ovipositor approximately as long as hind femur, regularly down-curved.

Coloration as in ♂, but typical pattern of pronotum weaker in some specimens ; elytra with one or two small round light spots ; apical part of ovipositor edged with black.

Length of body, ♂ 29.1–35.5, ♀, 39–41 ; pronotum, ♂, 9.4–10.1, ♀, 10.2–11 ; elytra, ♂, 8.4–9.1, ♀, 7.8–8.1 ; fore femur, ♂, 8.1–8.9, ♀, 9.1–9.4 ; hind femur, ♂, 25–26.3, ♀, 28.9–29.1 ; ovipositor, 26–26.4 mm.

Specimens examined : Crimea : Karadagh, 14.ix.1929, 2 ♂, 1 ♀ (S. Fedorov), 23.viii.1923, 1 ♂, 1 ♀ (V. Boldyrev) (Brit. Mus.).

Adelung described this species from a single female from Alushta (S. coast of Crimea). Miram (1929) gave description of ♂. I include it in *Anadrymadusa*, although the female ventral plate is of unique structure, and a distinct genus may be required when the whole group is better known.

6. *Anadrymadusa adzharica* (Uvarov, 1934)

1934. *Drymadusa adzharica* Uvarov, *Eos*, 10 : 48.

1939. *Drymadusa adzharica* Ramme, *Mitt. Zool. Mus. Berlin*, 24 (1) : 66.

♂. Fastigium of vertex wider than first antennal segment, with distinct median sulcus. Pronotum flattened at metazona ; first sulcus of pronotum very distinct, typical sulcus curved, a parabola behind middle of pronotum, posterior edge of pronotum round ; median carina very weak at metazona ; transverse depression behind typical sulcus very distinct ; lateral carina distinct on metazona ; shoulder excision shallow. Elytra extending to base of eighth tergite. Hind femur stout, but relatively short. Appendages of last tergite almost hook-like ; subgenital plate with a triangular emargination.

General coloration pale greyish-buff ; face uniformly creamy-brown, black band between eyes ; pronotum with typical pattern ; upper part of pronotal lobes reddish-brown, lower part light ; corner of shoulder excision blackish-brown. Elytra indefinitely marked with blackish-brown, brown and pale-buff, two oblong brown spots on a pale background in apical third of discoidal area. Hind femur with series of small brown dots along the middle of outer surface ; a series of transverse black-brown spots on the upper edge of base.

Length of body 41 ; pronotum 12.5 ; elytra 24 ; fore femur 11 ; hind femur 34.5 mm.

Specimen examined : NE. Turkey : Lomasheni near Artvin, 28.vi.1911, 1 ♂ (J. Voronov) (British Museum).

Uvarov described this species from a single male, and gave only measurements of female. Ramme (1939) described the female from Kvartschana (NE. Turkey : Tchorokh Province), 5.vii.1911 (Berlin Mus.), which I could not examine, and Ramme's data are used in my key.

7. *Anadrymadusa ornatipennis* (Ramme, 1926)

1926. *Paradrymadusa ornatipennis* Ramme, *Deut. ent. Zeitschr.* : 282.

1939. *Drymadusa ornatipennis* Ramme, *Mitt. Zool. Mus. Berlin*, **24** (1) : 67.

♂. Pronotum long, cylindrical ; posterior edge broadly rounded ; metazona flattened, median carina absent ; lateral carina weak, only at posterior end of metazona ; shoulder excision rather distinct. Elytra longer than pronotum, extending to middle of IV tergite. Appendages of last tergite crossed apically (possibly the effect of drying). Subgenital plate with round excision.

Black band between eyes ; pronotum with weak typical pattern, dark yellowish-brown spots on the pronotal lobes, its posterior edge dirty yellow, a broad and weak darkish median line ; elytra dark brown, with a series of small round yellowish spots, and some irregular whitish spots near posterior edge ; dark brown ring near the apices of femora and bases of tibiae ; spines of femora blackish-brown.

♀. Large. Pronotum stouter and wider, elytra longer than in ♂ ; lateral carina very weak, metazona not flattened. Legs stouter and longer, hind femur very strong.

Pronotum uniformly light dirty brown, without typical pattern ; dark stripe on the outer surface of hind femur.

Length of body, ♂, 32.6, ♀, 42.8 ; pronotum, ♂, 9.1, ♀, 12.1 ; elytra, ♂, 11.1, ♀, 12 ; hind femur, ♂, 31, ♀, 37.2 ; hind tibia, ♂, 31, ♀, 36.6 ; ovipositor, 28 mm.

Specimens examined : Greek islands : Samos (Marathokanpos), 1 ♂, 1887 (v. Oertzen) (type) ; Nisyros (S. Sporaden), 1 ♀ (v. Oertzen) (Berlin Mus.) ; Xantha, 1 ♀ (British Mus.).

Ramme records (1926) from Symi (S. Sporaden), 1 ♂ and Chios (Volissos), 1 ♀.

This species is described by Ramme from one male from Samos, one male (paratype) from Symi (S. Sporaden), one female from Chios (Volissos) and one female from Nisyros (S. Sporaden), but I am not sure that the two females which I studied belong to this species. Until a female from the type locality (Samos) is studied the problem remains open. Ramme (1939) recorded this species also from SW. Anatolia (Fethié = Makri), Göcek, 6. viii. 1930, 1 ♀ (R. Delmas) (Mus. Alexander Koenig in Bonn), but I have not seen this specimen and regard the record as improbable.

8. *Anadrymadusa albomaculata* (Karabag, 1956)

1956. *Drymadusa albomaculata* Karabag, *Com. Fac. Sci. Univ. Ankara*, (C), **5** : 8.

♀. Fastigium of vertex wider than first antennal segment, with distinct median sulcus. Pronotum relatively small, its posterior edge almost straight, pro- and mesozona slightly convex, metazona flat, first sulcus very distinct, typical sulcus roundly excised behind the middle of pronotum, median carina weak at the metazona, lateral carina distinct in metazona ; transverse depression almost in the middle of metazona ; shoulder excision distinct. Elytra much longer than pronotum, reaching the middle of V tergite, with a series of 3-4 round white spots. Ovipositor almost three times the length of pronotum.

General coloration brown, face reddish light brown ; frons with a black band between eyes ; pronotum uniformly brown, a light long spot below shoulder excision edge ; femora with dark brown pre-apical rings.

Length of body, 32.6 ; pronotum, 9.5 ; elytra, 13.4 ; hind femur, 33 ; hind tibia, 32.3 ; ovipositor, 27.8 mm.

Specimen examined : SW. Turkey, Muğla : Fethiye, c. 300–600 m., 15.vii.1953, 1 ♀ (type) (K. Erel) (British Museum).

I described this species from a single female, but the male of this distinct insect remains unknown.

V. *CERAEOCERCUS* Uvarov, 1910

1910. *Ceraeocercus* Uvarov, *Hor. Soc. ent. Ross.* **39** : 381.

1939. *Ceraeocercus* Ramme, *Mitt. Zool. Mus. Berlin*, **24** (1) : 61.

Fastigium of vertex flattened above, almost as wide as first antennal segment, gradually narrowed at the front, with very fine median sulcus.

Pronotum (Text-figs, 6, 6A), with flat metazona, its posterior edge almost straight, or very broadly rounded ; no median carina ; lateral carina very distinct on the metazona ; shoulder excision distinct ; first sulcus distinct ; typical sulcus also distinct, but interrupted in the middle, each branch ending in a round pit ; a transverse depression behind typical sulcus. Elytra and wing much longer than half of abdomen.

♂. Last tergite (Text-figs. 131, 131A) very large, with very broad lobes, its middle parts with distinct depression. Cercus (Text-fig. 132) cylindrical, without enlarged basal articulation, strongly incurved at the middle, two-branched at the apical part, second branch is on the upper side, both ending in very acute spine.

Face uniformly whitish, no continued black fascia between eyes ; only orbits of eyes and antennal sockets black, or blackish-brown ; front surface of fastigium of vertex and fastigium of frons same colour as the face. Elytra with blackish and creamy-buff irregular spots.

♀. Ovipositor much longer than half of hind femur, regularly down-curved.

DISTRIBUTION. Kazakhstan, Tadzhikistan, Turkmenistan, Hindukush.

KEY TO SUBSPECIES

- 1 (2) Elytra and wing do not reach hind knee ; wings black
 1. *fuscipennis fuscipennis* Uvarov
- 2 (1) Elytra and wing extend beyond hind knee ; wings brown with lighter fenestration
 2. *fuscipennis hindukushanus* Ramme

1. *Ceraeocercus fuscipennis fuscipennis* Uvarov, 1910

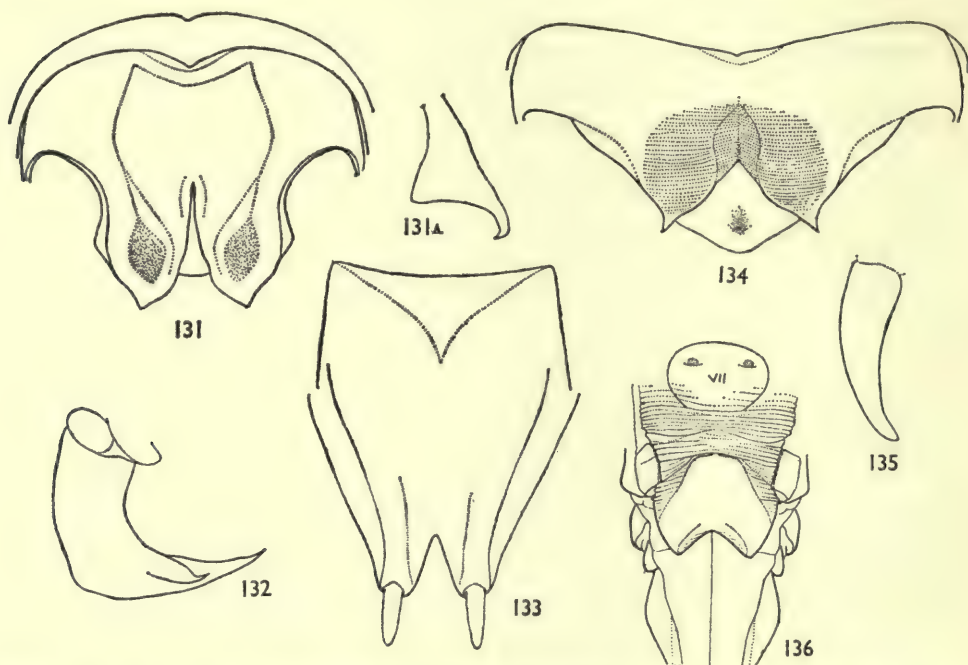
1910. *Ceraeocercus fuscipennis* Uvarov, *Hor. Soc. ent. Ross.* **39** : 382.

♂. Fastigium of vertex a little wider than first antennal segment. First sulcus of pronotum very distinct ; typical sulcus roundly curved a little behind middle of pronotum. Elytra reaching end of abdomen (in some specimens longer). Hind legs

relatively short and slender. Subgenital plate with deep subacute excision, styli conical (Text-fig. 133).

General coloration creamy-brown, orbits of eyes and antennal sockets blackish-brown; occiput blackish marbled; blackish-brown stripe behind eye; disc of pronotum with typical pattern and with two blackish parallel fine median lines; typical sulcus and its pits are black; lower half of lateral lobes creamy-brown; a creamy spot below the shoulder excision.

Elytra blackish-brown, with buff-creamy markings; first and second femora uniformly light brown; hind femur with brown marbled upper edge and a series of brown spots along the middle of outer surface; lower surface of tarsus dark brown.



FIGS. 131-136. 131, *Ceraeocercus fuscipennis fuscipennis* Uv., ♂ last tergite; 131A, apical parts of appendages in profile; 132, left cercus; 133, subgenital plate; 134, ♀ last tergite; 135, left cercus; 136, VII sternite, subgenital plate and basis of ovipositor.

♀. Appendages of last tergite (Text-fig. 134) broadly triangular, their apices pointed; cercus (Text-fig. 135) long and conical, regularly incurved, not branched. Ovipositor longer than twice the length of pronotum (in some specimens much longer).

Coloration as in ♂.

Length of body, ♂, 33-37.5, ♀, 35-42; pronotum, ♂, 9.1-9.4, ♀, 8.8-10.3; elytra, ♂, 26.3-29.8, ♀, 26-37.3; fore femur, ♂, 9.3-10.1, ♀, 9.4-11; hind femur, ♂, 26-30.7, ♀, 27.1-34.9; ovipositor, 22-28.3 mm.

Specimens examined: U.S.S.R.: Kazakhstan, Gurief Reg., Lake Inder, 22.vi.1951, 1 ♂ (topotype) (U. A. Chetyrkina); N. slope of Saur Mts. 1,100–1,200 m., 31.viii–5.ix.1946, 1 ♂, 1 ♀ (Krijanovskiy) (Bei-Bienko det.); Barsa Kilmes, Aral Sea, 2–12.vii.1928, 1 ♂ (Nazarof); N. slopes of Dzhungar Alatau, E. Kazakhstan, 1,800–2,000 m., 20 Km. Or. Tentek, vii.1947, 1 ♀ (Bei-Bienko) (Leningrad Mus.); Central Asia: Fergana, Vuadil, 28.iv.1913, 1 ♀ (Collect. ?) (British Museum); Krasnovodsk, Turkmenia, 21.vi.1932, 1 ♀ (Coll. Zool. Inst.); Kara-Tau, 10.vi.32, 1 ♀ (Pravdin); Alexandrovski range, 25.viii.31, 1 ♂ (Veltistshev) (Leningrad Mus.); Iran: Shakhroud, vi.1914, 1 ♀ (Kinitshenko) (Uvarov det.) (British Mus.); N. Iran: Khorasan, 1 ♂, 1 ♀ (Predtetschenski) (Leningrad Mus.).

This interesting species was described by Uvarov from the Lake Inder, but the species is widely distributed. Specimens from different localities differ, especially in the length of elytra and ovipositor, and pattern of head and pronotum. I regard all the specimens which I have examined as the same subspecies, but further studies of more abundant material are necessary.

2. *Ceraecercus fuscipennis hindukushanus* Ramme, 1939

1939. *Ceraecercus fuscipennis hindukushanus* Ramme, *Mitt. Zool. Mus. Berlin*, **24** (1): 61.

♂. More slender. Elytra very long and gradually narrowed; wings large, a little shorter than elytra. Legs relatively long and slender, hind femur very slender.

Coloration brown with creamy-buff pattern; metazona darker than pro- and mesozona, with pale brown median stripe; lower half of lateral pronotal lobes yellowish-brown, upper corner of shoulder excision with a blackish-brown spot, below it a light stripe on the posterior edge of the pronotal lobe; elytra blackish-brown, with creamy markings; and a series of oval whitish spots along the middle; femora greyish-brown.

♀. As in ♂. Ovipositor longer than $2\frac{1}{2}$ times length of pronotum, slightly decurved.

Coloration as in ♂.

Length of body, ♂, 40, ♀, 36.5; pronotum, ♂, 9.3, ♀, 10.6; elytra, ♂, 49, ♀, 45.1; fore femur, ♂, 11.7, ♀, 12; hind femur, ♂, 34.9, ♀, 37.3; ovipositor, 28.6 mm.

Specimens examined: Kondar Gorge, Tadzhikistan, 11.vii.37, 1 ♂, 1 ♀ (Gussakovskii) (Leningrad Museum).

This subspecies was described by Ramme from W. Hindukush, Andarab, Banu distr., 2,000–2,500 m., viii.1936, 1 ♀, and ♀ of *f. longipennis* from E.-Hindukush (Badachschan), Sebak.-Tal (Alpine zone), 2,800–3,000 m.

Unfortunately I have not seen the type of this subspecies, which differs by the longer elytra, particularly in *f. longipennis*, and by brown wings with lighter fenestration.

THREE NEW SPECIES OF
MALLOPHAGA (INSECTA)

THERESA CLAY



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BY

THERESA CLAY

British Museum (Natural History)

Pp. 43-58 ; Plates 1-3 ; 19 Text-figures



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THREE NEW SPECIES OF MALLOPHAGA (INSECTA)

By THERESA CLAY

NEW SPECIES OF HOLOMENOPON EICHLER, 1941 (MENOPONIDAE)

THE genus *Holomenopon* is known only from the bird order Anseriformes, although it seems to be nearly related to *Austromenopon* found on the Charadriiformes. It differs from this latter genus by the presence of a fourth head sensillus (see Clay, 1961), by the jagged edge of the prosternal plate (Text-fig. 3), and the tendency in the male to have more than one row of abdominal tergal setae. Both *Holomenopon* and *Austromenopon* have only two short mesothoracic setae and the mesothoracic plate is reduced to two irregular sclerites round these setae with an area of toothed integument posteriorly (Text-fig. 4).

There are a number of forms of *Holomenopon* distinguishable from each other mainly by the tergal chaetotaxy of the males; however, it has not been found possible at the present time to resolve the nomenclature of most of these owing to the lack of an adequate series of authentic material from *Anas crecca*, the host of *H. leucoxanthum* (Burmeister, 1838) the earliest described form. The present new species is, however, quite distinct from any other known species of *Holomenopon* by its size, asymmetry of the male abdomen and the characters of the genital region of the female.

Holomenopon goliath sp. n.

Type host: *Anseranas semipalmata* (Latham).

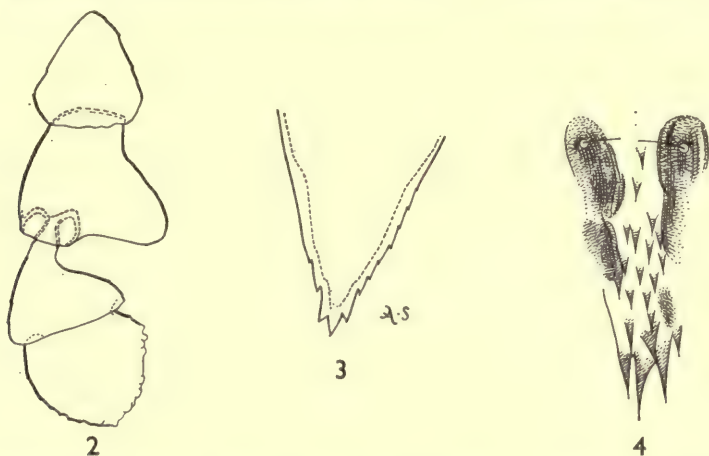
MALE. As shown in Text-figs. 1-7. Head with sensilli¹ 1-4 present; in other species of *Holomenopon* examined there is no sensillus 4 associated with the usual seta but there is a sensillus posterior to this seta lying in the centre of the head each side of the vertical mid line. The setae associated with sensillus 3 and 4 are surrounded by a line which perhaps represents the border of a less heavily sclerotized area. Lingual and sitaphore sclerites of the hypopharynx reduced; pharyngeal crest not apparent; antenna as in Text-fig. 2. Prosternal (Text-fig. 3) and mesosternal (Text-fig. 4) plates as in the figures. Mesothorax well defined dorsally with anterior mesothoracic setae (see Clay, 1961) 4 in number, small and lying

¹ These circular clear areas of the head and those associated with the post-spiracular setae have previously been referred to as sensilli although their true function is unknown. It might be more satisfactory to use a neutral term such as "leucodisc", but in order not to change the terminology of the taxonomically important ones of the head and abdomen the term sensilli will continue to be used for these.



FIG. 1. *Holomenopon goliath* sp. n. Male. A horizontal line across a seta indicates that it is broken, a dotted line that it has been completed from another specimen.

close together. Abdominal sternite VIII (and possibly IX) show asymmetry (Text-fig. 5). Genitalia unlike any other in the genus, as shown in Text-figs. 6-7; it has not been possible to do more than indicate the general appearance of the sclerite of the genital sac (Text-fig. 7) as the shape of this structure alters according to the pressure on the walls of the sac. Abdominal chaetotaxy as in Text-fig. 1, but there is some individual variation in number and arrangement of the setae.



FIGS. 2-4. *Holomenopon goliath* sp. n. Male. 2. Outline of antenna. 3. Prosternal plate. 4. Mesosternal plate.

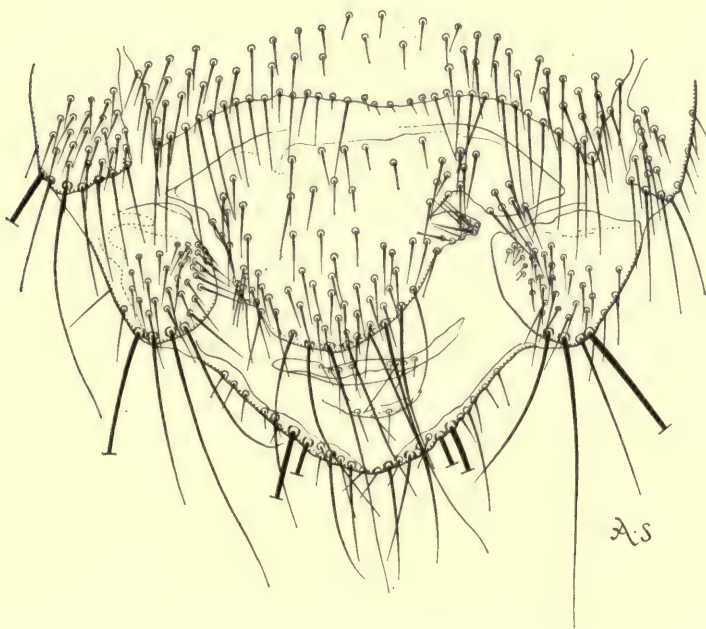


FIG. 5. *Holomenopon goliath* sp. n. Terminal sterna of male abdomen.

On segments I-II, the first seta is spine-like and the post-spiracular is the second seta each side; in the remainder of the segments the post-spiracular seta is the outer marginal seta each side.

FEMALE. As shown in Pl. I, fig. 1. General characters of head and thorax as in male. Abdominal tergites with marginal row of setae only, the shorter setae in this row are more spine-like than in the male; last tergum (fused IX-XI) without setae. Genital region as shown in Text-fig. 8; the internal forked structure is probably associated with the genital chamber.



FIGS. 6-7. *Holomenopon goliath* sp. n. Male genitalia. Genital sac is shown enlarged in fig. 7.

Measurements in mm.
(In Canada balsam)

	Male		Female	
	Length	Breadth	Length	Breadth
Head	0.43	0.83	0.40	0.75
Prothorax*	0.28	0.61	—	0.60
Mesothorax*	0.09	0.52	—	—
Metathorax*	0.18	0.71	—	0.67
Abdomen	1.64	0.99	1.52	1.00
Total	2.71	—	2.50	—
Genitalia	1.35	—	—	—

* Length of thoracic segments taken along midline of terga, the condition of the female is too poor to enable these measurements to be taken.

Material examined: 5 ♂ from *Anseranas semipalmata* from Townsville, Queensland, Australia, collected by Mr. H. J. Lavery (Department of Agriculture and Stock, Queensland) 5.8.1958; 1 ♀ from *Anseranas melanoleucus* = *A. semipalmata* without further data, in the Harrison collection of the British Museum (Natural History).

Holotype ♂ from *Anseranas semipalmata* with the above data in the Queensland Museum, Brisbane; *allotype* ♀, slide no. 656 in the British Museum (Natural History).

Paratypes: 4 ♂ from the same host species with data as given above.

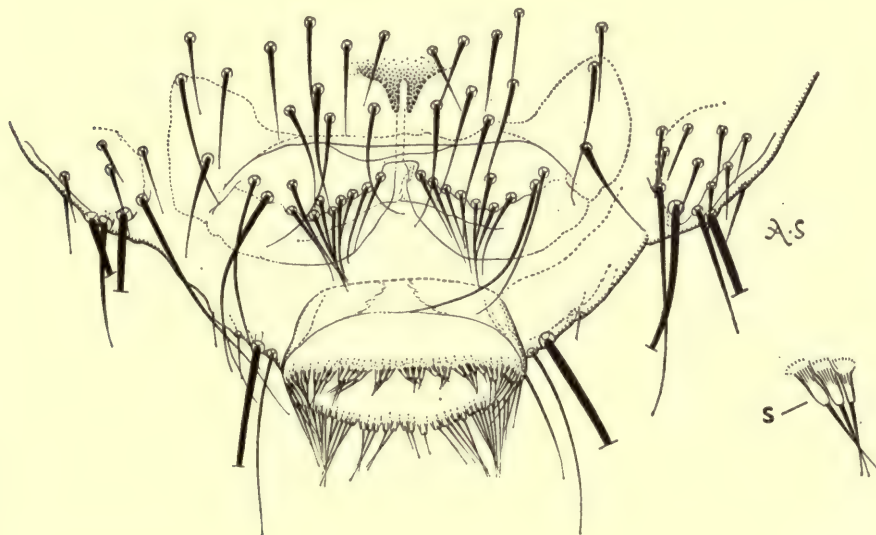


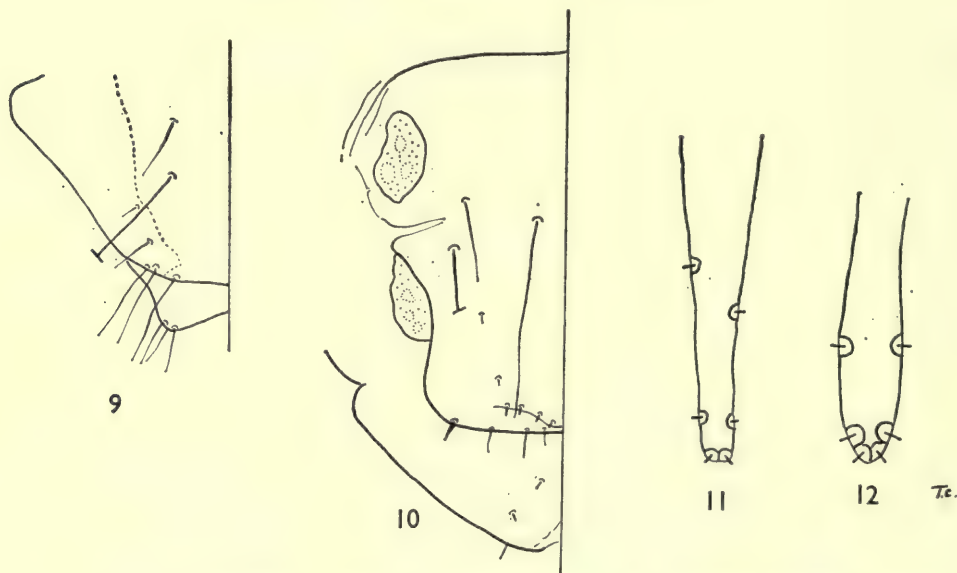
FIG. 8. *Holomenopon goliath* sp. n. Terminal sterna of female abdomen. s.—enlarged view of setae round anal opening.

A NEW SPECIES OF RHYNONIRMUS THOMPSON, 1935 (PHILOPTERIDAE)

The differences between the *Otidoecus*-complex (including *Otidoecus*, *Rhynonirmus* and *Cuclotogaster*) and the *Degeeriella*-complex have been discussed elsewhere (Clay, 1958 : 125), but whether it will be possible to retain the separation of *Rhynonirmus*, *Cuclotogaster* and *Otidoecus* seems doubtful. For the purpose of this paper, however, the species of this complex from the Charadriiformes will be referred to as *Rhynonirmus*. A key to the genus to include the new species is given below (see also Timmermann, 1957 : 89).

Rhynonirmus parsonsae sp. n.

Type host : *Philohela minor* (Gmelin).



FIGS. 9-12. *Rhynonirmus*. 9-10. *R. parsonsae* sp. n. 9. Terminal sterna of male abdomen ; there is variation in number and position of setae. 10. Terminal sterna of female abdomen. 11-12. Distal end of "penis". 11. *R. parsonsae* sp. n. 12. *R. infuscatus* (Osborn).

This species can be distinguished from *infuscatus* (Osborn) by the shape of the head in both sexes, in the male by the relatively longer first antennal segment and the characters of the genitalia, and in the female by the shape of the last segment of the abdomen.

MALE. Shape of the head as in Pl. 2, fig. 2, marginal carina thicker than that of *infuscatus* (Pl. 2, fig. 1) and the shape of its inner margin different. Chaetotaxy of head and general characters of antenna as in *infuscatus* (Thompson, 1935 : 283),

but the first antennal segment is longer; in both species the third segment may appear as shown in the figure by Terzi (*Ibid.*, fig. 1b) or when mounted in a different position as in the figure of *R. scolopacis* (*Ibid.*, fig. 2b); in both *infuscatus* and this species there is only one seta in the middle of the dorso-anterior margin of segment 4 of the antenna, not three as shown in the figure. Thorax as in *infuscatus*. Abdomen in general as in *infuscatus* but in *parsonsae* tergite II is usually completely separated medially, though an occasional specimen has a thin junction posteriorly, whereas in all specimens of *infuscatus* examined tergite II is never completely separated into two plates; in this species tergites V–VII are narrowed centrally to a greater extent than in *infuscatus*, and V in some specimens is interrupted medially. Genitalia (Pl. 2, fig. 6; Text-fig. 11) similar to those of *infuscatus* (Thompson, 1935, fig. 4a) but differing by the mesosome not showing a divided plate as in Pl. 2, fig. 3, m., by the inner arm of the mesosome being more strongly sclerotized and differently shaped (Pl. 2, figs. 3 & 6, a) and by the position of the setae on the "penis" (Text-figs. 11–12); the two anterior setae may or may not be placed asymmetrically.

FEMALE. General characters as shown in Pl. 2, fig. 5; marginal carina as in male. This species differs from *R. infuscatus* in having tergites II–V or VI deeply indented medially and VI or VII and sometimes VIII with a shallow notch; the terminal segment (fused IX–XI) differs in shape from that of *infuscatus* (Pl. 2, figs. 4–5).

CHAETOTAXY OF THORAX AND ABDOMEN. That of thorax as in *infuscatus* (in Thompson, 1935) except for the posterior margin of the pterothorax where only that of the female is given and no mention made of variation. In both species the female setae are usually arranged (from the outside) $1 + 2 + 2$ each side, but some specimens have $1 + 2 + 3$ on one side and one specimen of *parsonsae* has the arrangement on one side $1 + 2 + 1 + 2 + 1$, which is nearer that of the male. In the male the arrangement is $1 + 2 + 3 + 1$ or $1 + 2 + 4 + 1$. Abdominal chaetotaxy in both sexes similar to that of *infuscatus* but there are fewer sternal setae. Post-spiracular setae in both sexes of *parsonsae* are found on segments III–VIII, those of III–V being long and stout and having contiguous sensilli. Pleural setae in both sexes: II–III, 0; IV–V, 1; VI–VII, 2; VIII, 3; IX, 2 and in the female: X, 2. Tergocentral setae of male: II, 3–4 with two long anterior setae; III–VIII, 4 with the occasional specimen having one segment with 5; IX, 2; X, 6 ($3 + 3$). In the female: II, 2–4 with two long anterior setae; III–VIII, usually 4, but specimens have been seen with only 2 setae on III or IV, or 3 on V, VI, or VIII, or 5 on VI or VIII; the anterior setae on the last tergum (fused IX–XI) may be absent or 1–3 in number; X, 4 ($2 + 2$). Sternal setae in both sexes: II, 2 or 3, rarely 4, with 2 anterior leucodiscs¹; III–VI, usually 4, occasionally one segment may have 5 and there are 2 leucodiscs in the line of setae; in the male: VII, 4; VIII, 2; female genital plate with 6. Ventral chaetotaxy of the last segments as in Text-figs. 9–10. In the male of *infuscatus*, although any of the sternites III–VII may have only 4 setae, no single specimen has been seen with 4 setae on all segments (which is the rule in *parsonsae*); one has been seen with the following numbers: III–IV, 4; V–VI, 5; VII, 4; most specimens have two or more segments with 6; segments IV or V may have 7 setae.

¹ See footnote on p. 45.

Measurements in mm.
(In Canada balsam)

	Male		Female*	
	Length	Breadth	Length	Breadth
Head	0.46	0.32	0.51	0.38
Prothorax	—	0.22	—	0.27
Pterothorax	—	0.29	—	0.36
Abdomen	0.88	0.40	1.06	0.50
Total	1.69	—	1.87	—
Genitalia†	0.30	—	—	—

* Not in Canada balsam.

† Different specimen.

	Breadth of head at temples				R‡	
	Male		Female		Male	
	Range	Mean	Range	Mean	Range	Mean
<i>R. infuscatus</i>	0.30-0.33	0.31 (11)	0.34-0.37	0.35 (10)	21.6-24.3	23.1 (20)
<i>R. parsonsae</i>	0.30-0.34	0.32 (15)	0.35-0.38	0.36 (8)	25.0-29.0	27.0 (14)

$$R‡ = \frac{\text{Length 1st antennal segment} \times 100}{\text{Head length}}$$
 Number of antennae in brackets.

It is not possible in treated specimens to get an accurate measurement of the length of the antennal segments.

MATERIAL EXAMINED. 16 ♂, 28 ♀ from *Philohela minor* from Amherst, Massachusetts, U.S.A., collected by Miss Margaret A. Parsons, July, 1957 and 6 ♂, 31 ♀ from the same host species from various localities in the U.S.A.

Holotype ♂ and *allotype* ♀ in the Smithsonian Institution, United States National Museum, Washington, from Amherst, Massachusetts.

Paratypes: 21 ♂, 58 ♀ from the same host species, data given above.

KEY TO THE SPECIES OF *Rhynonirmus*

- 1 Anterior margin of head rounded laterally (Pl. II, figs. 1-2, 4-5, Pl. III, fig. 1) 2
- Anterior margin of head angled laterally (Pl. III, fig. 2) 4
- 2 (1) Anterior margin of head pointed medially (Pl. III, fig. 1) *helvolus* (Burm., 1838)
- Anterior margin of head not pointed medially (Pl. II, fig. 1) 3
- 3 (2) Shape of head, inner margin of marginal carina and terminal segments of ♀ abdomen as in Pl. II, figs. 1 and 4 *infuscatus* (Osborn, 1896)
- Shape of head, inner margin of marginal carina and terminal segments of ♀ abdomen as in Pl. II, figs. 2 & 5 *parsonsae* sp. n.
- 4 (1) Males 5
- Females 7
- 5 (4) End of parameres reach to or beyond middle pair of setae on "penis" 6
- End of parameres do not reach to middle pair of setae; shape of mesosome and parameres as in Pl. III, fig. 5 *medius* Timmerman, 1955

- 6 (5) Shape of parameres and mesosome as in Pl. III, fig. 3 . *scolopacis* (Denny, 1842)
 - Shape of parameres and mesosome as in Pl. III, fig. 6 *stenurae* Timmermann, 1955
 7 (4) Anterior margin of head usually straight (occasionally slightly indented), inner
 margin of marginal carina parallel with anterior margin of head; tergites
 V-VI usually with slight anterior notch, deeper slit occasionally on V
medius Timmermann
 - Anterior margin indented medially; inner margin of marginal carina usually
 slightly convex; tergites V, VI and sometimes VII with some anterior median
 division, V-VI usually with deep narrow slit . . . *scolopacis* (Denny)
*stenurae** Timmermann

* It has not been possible to use the character of the anterior margin of the head to separate all specimens of *medius* from *scolopacis* and *stenurae*. Females of *scolopacis* average somewhat larger than those of *stenurae* but there is some overlap. No males of the population from *Capella delicata* (described as *R. magnocephalus* (Carriker, 1902)) have been seen.

NOTE ON HOST DISTRIBUTION OF RHYNONIRMUS. The occurrence of a species of *Rhynonirmus*, a genus otherwise restricted to the subfamily Scolopacinae, on *Bartramia* (subfamily Tringinae) may indicate affinities of this latter host to the Scolopacinae as suggested by Timmermann (1957: 89), or it may be a case of secondary infestation, stragglers from *Philohela* having become established on *Bartramia* with subsequent modification. This would be a case of the rather rare geographical distribution of Mallophaga in which hosts belonging to the same bird order in one geographical area are parasitised by the same or similar Mallophaga irrespective of the relationship of their hosts. An example of this is seen in the distribution of *Aquanirmus* on the grebes of Europe, Africa and N. America.

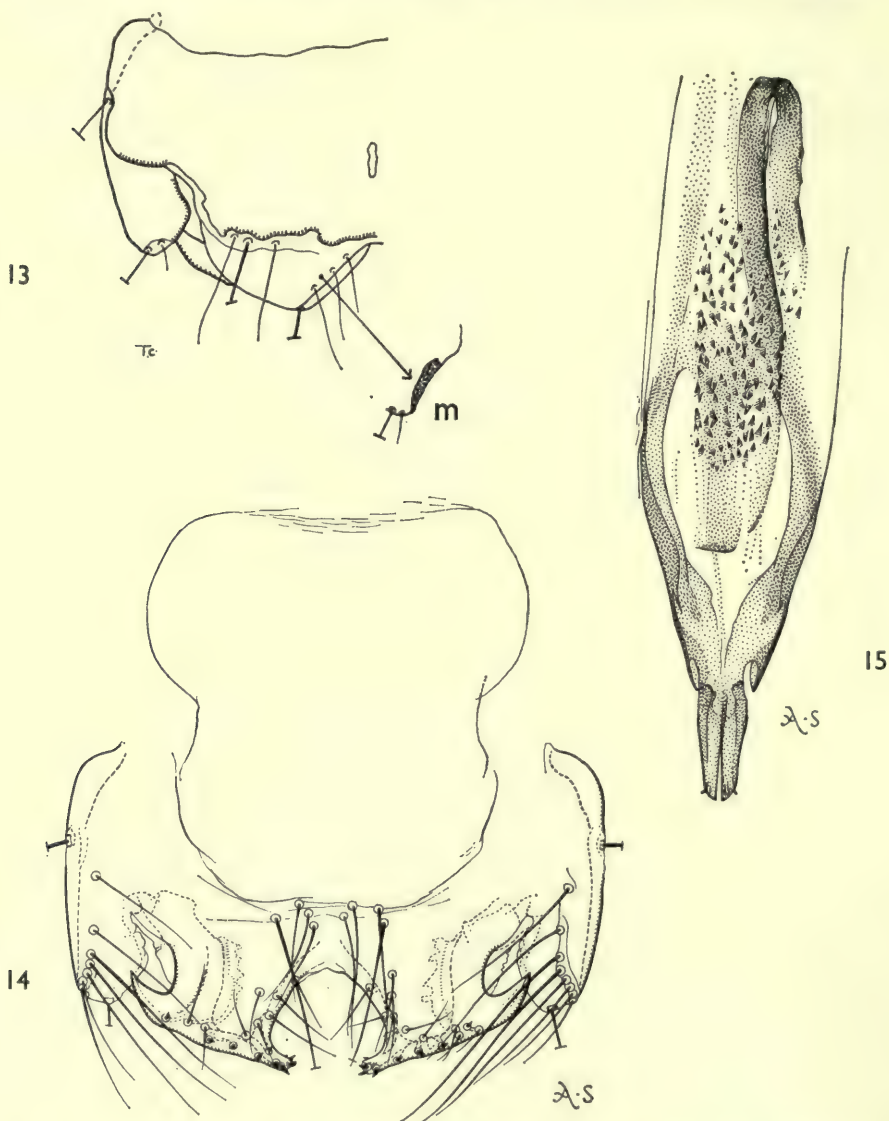
A NEW SPECIES OF PECTINOPYGUS MJÖBERG, 1910 (PHILOPTERIDAE)

Five species (listed below) of *Pectinopygus* have been described from *Pelecanus*. With the exception of *Pelecanus conspicillatus* (the host of *P. australis* Thompson) and *Pelecanus philippensis*, specimens have been seen from all the species of *Pelecanus* listed in Peters, 1931 (*Check-list of Birds of the World*). Each of these has a specific *Pectinopygus* with the exception of *P. roseus*, on which the population of the parasite appears to be conspecific with that on *P. onocrotalus*. The males are most easily distinguished from each other by the characters of the genitalia and the terminal segments of the abdomen, figures showing the characters of this latter part of the abdomen are included (with the exception of that of *Pectinopygus australis*) for comparison with the new species. *P. tordoffi* (Text-fig. 19) differs from the males of all other species examined in the lateral margin of the last segment not being produced forward each side as a projecting curved heavily sclerotized hook, one of the characters used to separate the subgenus *Epipelecanus* Harrison, 1935.

***Pectinopygus forcipatus* sp. n.**

Type host : *Pelecanus rufescens* Gmelin.

The male of this species is most similar to *P. forciculatus* from which it is distinguished by the shape of the head, the terminal segments of the abdomen and the genitalia. The available females are in too poor condition for description.



FIGS. 13-15. *Pectinopygus forcipatus* sp. n. Male. 13-14. Terminal segments of abdomen. 13. Dorsal. m.—dorsal margin of genital opening hidden in the figure by the margins of the anal opening. 14. Ventral. 15. Genitalia.

MALE. General appearance as in Pl. I, fig. 2. Antenna as shown in Thompson, 1948, fig. 6. Details of head and thorax as in other species from *Pelecanus* (see Elbel & Emerson, 1956); postero-dorsal margin of prothorax with one short and one long lateral seta each side; on each side of the postero-dorsal margin of the pterothorax there is an outer small spine-like seta, a long seta near this, a shorter seta and three long stout and one shorter slightly anterior setae grouped together in an unpigmented area. This arrangement is found in 10 of the 14 individuals examined; in addition one specimen has one of the long setae in the group absent on one side and three have an extra shorter seta in the group on one side only. Outline of thoracic sternal plates not definable in the available material; sternal setae as in *P. tordoffi*. Abdomen with tergites II–VIII separated medially; posterior terga fused into one transverse plate (Text-fig. 13). Sternites II–VII in the form of central plates, those on segments III–VII being more heavily sclerotized laterally, giving the appearance of two plates on each segment; posterior sternites fused to form a subgenital plate, this plate in all species is irregular and somewhat variable

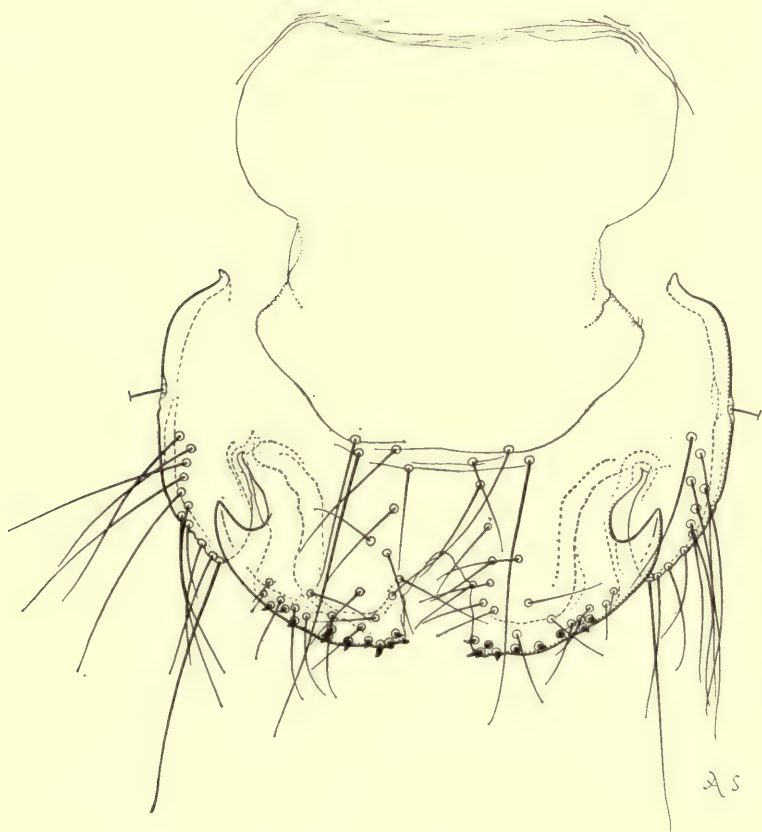
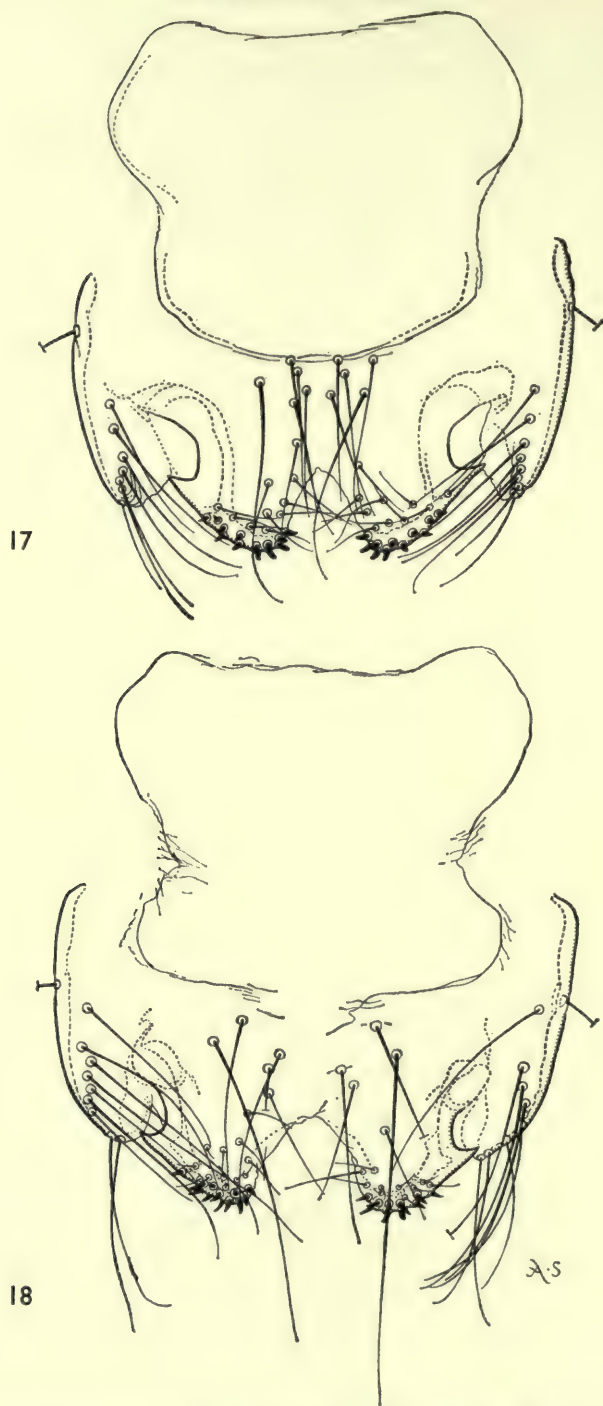


FIG. 16. *Pectinopygus forficulatus* (Nitzsch). Terminal sterna of male abdomen.



FIGS. 17-18. Terminal sterna of male abdomen. 17. *Pectinopygus bifasciatus* (Piaget). Lectotype. 18. *P. occidentalis* Thompson. Paratype.

in outline. Sterna of posterior segments as in Text-fig. 14, narrow sclerite lying vertically along each dorsal margin of the genital opening well marked (Text-fig. 13, m). Genitalia as in Text-fig. 15.

CHAETOTAXY OF ABDOMEN. On II-VIII with the exception of VI, there is a single marginal seta lying posterior to the spiracle which is probably the post-spiracular seta, but apparently without associated sensilli on any of the segments. Tergocentral setae: II-VIII, 4, the two most central setae are placed a little anteriorly to the outer two; segment II with two anterior central setae in addition. Pleural setae: II, 1-2; III-V, 2; VI-VIII, 4-5. Sternocentral setae: II, 3-5; III, 8-11; IV-V, 8-12; VI, 8-10; VII, 5-9; VIII, 2-3.

Measurements of male in mm.
(In Canada balsam)

	Length	Breadth		
		Range		Mean
Head	0.65 .	0.53	0.52-0.56	0.54 (13)
Prothorax	— .	0.42	—	—
Pterothorax	— .	0.53	—	—
Abdomen	2.11 .	0.63	—	—
Total	3.34 .	—	—	—
Genitalia*	0.90 .	—	—	—

* Different specimen.

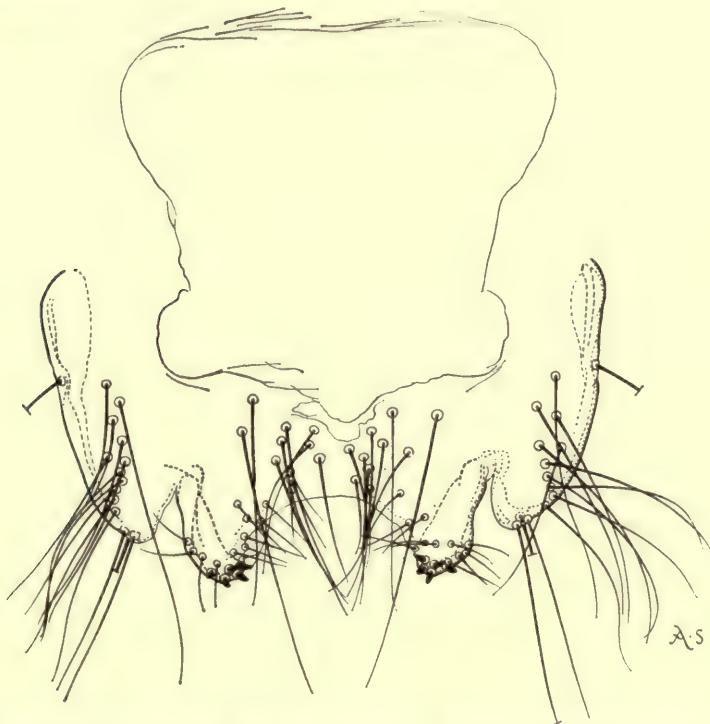


FIG. 19. *Pectinopygus tordoffi* Elbel & Emerson. Terminal sterna of male abdomen.

Material examined: 24 ♂ from *Pelecanus rufescens* from Kenya, Sudan, North Cameroons and Portuguese Guinea. I am indebted to Dr. J. Mouchet and Dr. J. Tendeiro for the opportunity to examine the specimens from the last two localities.

Holotype male in the British Museum (Natural History), slide no. 657, from *Pelecanus rufescens* Gmelin from Marou, N. Cameroons, 1959, collected by Dr. J. Mouchet. Paratypes: 23 ♂ from the same host species, data as given above.

Lectotype of *Pectinopygus bifasciatus* (Piaget, 1880): Male in the Piaget collection, British Museum (Natural History), slide no. 798. Paratypes: 3 males.

LIST OF SPECIES OF PECTINOPYGUS FROM PELECANUS

Species	Type host
<i>P. forficulatus</i> (Nitzsch, 1866).	<i>Pelecanus onocrotalus</i> Linn. (Also on <i>P. roseus</i> Gmelin).
<i>P. bifasciatus</i> (Piaget, 1880).	<i>Pelecanus crispus</i> Bruch.
<i>P. occidentalis</i> Thompson, 1948.	<i>Pelecanus o. occidentalis</i> Linn.
<i>P. australis</i> Thompson, 1948.	<i>Pelecanus c. conspicillatus</i> Temminck.
<i>P. tordoffi</i> Elbel & Emerson, 1956 (= <i>P. canadensis</i> Carriker, 1956).	<i>Pelecanus erythrorhynchos</i> Gmelin.
<i>P. forcipatus</i> sp. n.	<i>Pelecanus rufescens</i> Gmelin.

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 — 1948. *Ann. Mag. nat. Hist. (11)* **14** (1947): 317-327.
 TIMMERMAN, G. 1957. *Parasitologisches Schriftenreihe, Jena*, **8**: 1-204.

ADDENDUM TO THE CHECK LIST OF MALLOPHAGA HOPKINS & CLAY, 1952

Philoaterus maruhashi Uchida, 1949 was referred with doubt to the genus *Craspedorrhynchus*, now through the kindness of Dr. J. E. Scanlon it has been possible to examine a paratype which shows that the species is a *Cuculoecus*.



PLATE I

FIG. 1. *Holomenopon goliath* sp. n. Female allotype. (B. M. Neg. 27447)

FIG. 2. *Pectinopygus forcipatus* sp. n. Male holotype. (B. M. Neg. 27446)



1



2

PLATE 2

FIG. 1. *Rhynonirmus infuscatus* (Osborn). Male. (Breadth at temples : 0.31 mm.) (B. M. Neg. 27448)

FIG. 2. *Rhynonirmus parsonsae* sp. n. Male holotype. (Breadth at temples : 0.32 mm.) (B. M. Neg. 27451).

FIG. 3. *Rhynonirmus infuscatus* (Osborn), ♂ genitalia. (B. M. Neg. 27442)

FIG. 4. *Rhynonirmus infuscatus* (Osborn), Female. (Breadth at temples : 0.35 mm.) (B. M. Neg. 27452)

FIG. 5. *Rhynonirmus parsonsae* sp. n. Female allotype. (Breadth at temples : 0.38 mm.) (B. M. Neg. 27449)

FIG. 6. *Rhynonirmus parsonsae* sp. n. Male genitalia. (B. M. Neg. 27444)

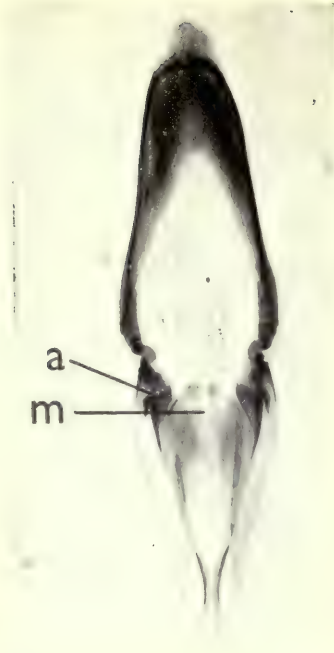
Figs. 1, 2, 4, 5 at same magnification ; figs. 3 and 6 at same magnification.



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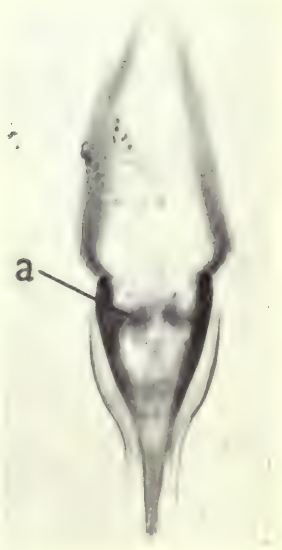
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6

PLATE 3

- FIG. 1. *Rhynonirmus helvolus* (Burmeister). Male. (*B. M. Neg.* 27450.)
FIG. 2. *Rhynonirmus scolopacis* (Denny). Male. (*B. M. Neg.* 27453)
FIG. 3. *Rhynonirmus scolopacis* (Denny). Male genitalia. (*B. M. Neg.* 27443)
FIG. 4. *Rhynonirmus helvolus* (Burmeister). Male genitalia. (*B. M. Neg.* 27440)
FIG. 5. *Rhynonirmus medius* Timmermann. Male genitalia, p.—end of paramere. (*B. M. Neg.* 27436)
FIG. 6. *Rhynonirmus stenurae* Timmermann. Male genitalia. (*B. M. Neg.* 27441)
Figs. 1-2 at same magnification ; Figs. 3-6 at same magnification.

*Photographs by J. V. Brown
British Museum (Natural History)*



1



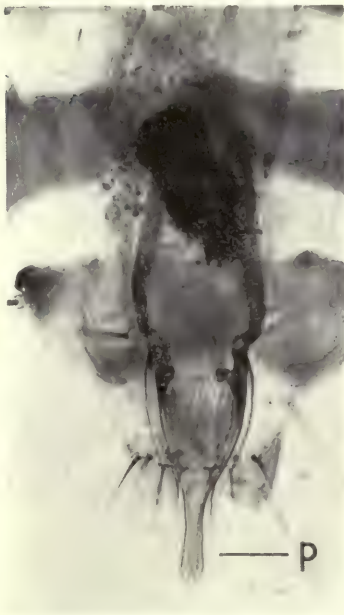
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6

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THE MONOCHAMINI
(CERAMBYCIDAE) OF THE
ETHIOPIAN FAUNISTIC REGION.
II. SUBTRIBE MONOCHAMIDI.
GENERA RELATED TO
MONOCHAMUS

LAWRENCE S. DILLON
AND
ELIZABETH S. DILLON



BULLETIN OF
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ENTOMOLOGY Vol. II No. 3
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Xufs

Pp. 59-96



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THE MONOCHAMINI (CERAMBYCIDAE) OF THE ETHIOPIAN FAUNISTIC REGION.

II. SUBTRIBE MONOCHAMIDI. GENERA RELATED TO *MONOCHAMUS*

By LAWRENCE S. DILLON & ELIZABETH S. DILLON

ALTHOUGH the genus *Monochamus* is represented by several species in North Africa, it became apparent during the course of these studies that none of the numerous Ethiopian species assigned to this genus by other workers truly pertained to it. As a superficial study of Indo-Australian representatives showed a comparable situation, it is not unlikely that the genus will be found to be entirely confined to the Holarctic Region.

The genus *Monochamus* in the restricted sense should include those species in which the eyes are approximate above, the lower ocular lobe elongate, narrow, and vertical, usually shorter than the gena in height and never distinctly exceeding it in this respect; the front subquadrate, sometimes slightly narrowed above, the antennal tubercles contiguous at base, divergent apically; pronotal disk at most bearing a low median tumescence, not tuberculate, lateral tubercles situated at the middle, armed with a short upturned spine; elytra sparsely granulate basally, especially near humerus, feebly tumescent at middle of base, never crested, humeral angle rounded, unarmed with tubercles or spines, elytral apices rounded, unidentate, or singly spined; forelegs slightly longer than hind ones in male, subequal in female; antennae longer than body in both sexes, especially in male, the scape subcylindrical, not or only feebly flared at apex, the cicatrix closed, extending more than half-way around the apical margin.

From this set of characters, the Ethiopian forms differ consistently, especially in the size and shape of the lower ocular lobe, in pronotal sculpturing, and, frequently, in the armature of the elytral base and humeral angle, not to mention differences in antennal formulae and leg ratios.

For making available to them the valuable collections of the British Museum (Natural History) [BM], upon which this portion of the study is principally based, the authors are indebted to J. Balfour-Browne, as well as for numerous other favours. In addition to this material, collections of a number of other institutions and individuals have been drawn upon, for a list of which, with abbreviations employed, reference should be made to part I of this series of studies.¹

¹ Published 1959 as Scientific Publication of the Reading Public Museum and Art Gallery, number 9.
ENTOM. 11, 3.

ETHIOPIOCHAMUS gen. n.

Moderately large to large, cylindrical beetles. Head of moderate length; front not retracted, slightly transverse, feebly narrowed between eyes; eye with lower lobe broad, one and one-half to two times as tall as gena, isthmus at least half as wide as upper lobe, upper lobes separated by at most a distance equal to one of their widths; antennal tubercles subapproximate at base, strongly divergent, prominent. Pronotum feebly narrower apically, sides nearly straight, feebly wider at base than long; lateral tubercles median, moderately prominent, with a short tooth; disk with three to five tubercles, with a broad anterior median impression, punctate; a single transverse sulcus at base and at apex, distinct. Scutellum wider than long, apex rounded. Elytra granulate-punctate near base, more or less seriatly punctate; basal gibbosity subprominent, without a crest; humeri rounded; apices truncate; sides gradually narrowed apically, more strongly so near extreme apex. Prosternum simple, one-fifth to two-fifths as broad as a procoxal cavity; mesosternal process one-third to one-half as broad as a mesocoxal cavity, unarmed, subtruncate at apex. Legs moderate in length, front ones longest in males; metafemora attaining base of fifth sternite, all femora subcylindrical, thicker medially; tibiae subequal to femora in length, unarmed; protarsi slightly dilated and feebly fringed in male. Antennae one and two-thirds to two times as long as body, about one and one-third to one and one-half times body length in female, beneath fimbriate at least to fourth segment; scape robust, gradually clavated, flared at extreme apex, extending usually at most to apical third of pronotum, cicatrix rather narrow, expanded laterally, extending nearly two-thirds around apical margin; third segment robust and feebly bisinuate in the *ruspator* group, swollen and arcuate in the *centralis* group, three-fourths to once again as long as scape; fourth swollen in *centralis* group, slightly shorter than third; fifth at least equal to first; rest gradually shorter.

Type species: *Lamia nubifer* Gyllenhal.

REMARKS. This genus is distinguished by the shape of front, the large eyes, the pronotal sculpturing, the elytra with granulate-punctures basally, the discal punctures more or less seriate, by the shape of the scape, and by the antennal formula.

KEY TO SPECIES

- | | | |
|----|--|------------------------|
| 1. | Elytra just behind middle with a common, dark fascia | 2 |
| | Elytra without a post-median, common, dark fascia | 4 |
| 2. | Elytra broadly dark at base, with a broad, common, pale fascia extending across or nearly across their entire width ¹ | 3 |
| | Elytra largely dark on entire basal half, with a small, pale, common macula at basal third | <i>ruspator</i> |
| 3. | Elytral dark basal area broader toward suture | <i>nubifer</i> |
| | Elytral dark basal area with its posterior margin straight, not widened at suture | <i>griseoplagiatus</i> |
| 4. | Elytra covered with pale ashy pubescence | 5 |
| | Elytra covered with greyish brown pubescence | 7 |

¹ *ochraceomaculatus* Breuning, unseen during the course of this study, will possibly key out here.

5. Elytra with a distinct, whitish macula toward sides behind middle . . . **murinus**
 Elytra with a distinct, dark, transverse macula toward sides behind middle . . . 6
6. Elytra ashy pubescent, variegated with brownish (in addition to the interspersed maculae), post-median dark macula usually more distinct and densely pubescent ; body form robust ; male with third antennal segment more tumid . . . **ruficornis**
 Elytra with ashy pubescence not varied with brownish, post-median dark macula more poorly defined, nearly glabrous ; body form slender ; male with third antennal segment feebly tumid . . . **irrorator**
7. Abdomen with dark maculae on sides of first three or four sternites . . . **centralis**
 Abdomen without lateral dark maculae . . . 8
8. Elytra with dark maculae only at extreme basal margin and several small ones just behind middle . . . **plumbeus**
 Elytra with dark basal and post-median maculae as well as scattered small ones, especially at basal third . . . 9
9. Elytra each with dark area broad, extending to basal sixth ; antennae and legs piceous . . . **tropicalis**
 Elytra with dark basal macula confined to declivous portion near scutellum . . . **scabiosus**

***Ethiopiochamus griseoplagiatus griseoplagiatus* Thomson (comb. nov.)**

Monochamus griseoplagiatus Thomson, *Arch. Ent.* **2**, 1858 : 166, pl. 5, f. 3. Olivier, *Journ. Sc. Math. Nat. Lisboa*, **10**, 1884 : 11. Breuning, *Nov. Ent. suppl.* **3** (2), 1944 : 422.

MALE. Head and pronotum piceous, greyish brown pubescent. Scutellum bright fulvous pubescent, medially darker. Elytra densely dark brown pubescent, a common, triangular, whitish fascia behind basal fifth, extending to side margins and nearly to middle of suture, at apical quarter a similar smaller fascia, irregular, extended anteriorly along suture, much interrupted ; lateral margin with a few whitish, scattered maculae. Body beneath, legs, and antennae reddish brown, rather finely clothed with yellowish brown pubescence ; antennae beginning with fourth segment greyish annulate basally.

Head above minutely alutaceous, vertex with a few rather coarse punctures ; front subquadrate, widened to epistoma, impunctate ; eye with lower lobe one-half again as tall as gena, broadly oblong. Pronotum feebly wider at base than long ; apical and basal sulci narrow, the former sharply recurved at middle ; lateral tubercles broad, well elevated, ending in a short, obtuse spine ; disk with three tubercles, the median one placed closer to the base and much larger, surface rather sparsely, moderately punctate. Elytra with basal fifth sparsely, rather coarsely granulate, thence finely punctate to apex, the punctures nearly obsolete before apex ; apices broadly subtruncate ; humeri simply rounded. Antennae twice as long as body, heavily fimbriate beneath to fourth segment, thence sparsely so to apex ; scape robust, coarsely, rugosely punctate, slightly surpassing apex of pronotum ; third segment nearly straight, more than twice as long as first ; fourth more than one-half and fifth one-half again as long as first ; rest gradually shorter, except eleventh which is slightly elongate.

FEMALE. As in male but more robust ; antennae one-fourth again as long as body, densely fimbriate to fifth segment ; third segment less than twice as long as first ; fourth one-third longer than first and fifth equal to first.

Length 21–28.5 mm. ; width 6–8.4 mm.

Type locality : Gabon.

DISTRIBUTION : Central Africa, from Belgian Congo to the Cameroons.

Gabon : 1 ; no further data [ANSP].

Belgian Congo : 1 ; Stanleyville [ZSM].

Central Africa : 1 ; no further data [SM].

REMARKS. This species resembles *E. ruspator* somewhat, but here the front is impunctate, and the pronotal disk is distinctly tuberculate.

***Ethiopiochamus griseoplagiatus leonensis* subsp. n.**

FEMALE. Same as the nymotype but the markings on the elytra are either whitish or yellowish ; on the same organs there is a small fascia at middle, not attaining suture, and the basal macula extends from the humerus.

Length 25 mm. ; width 7 mm.

Holotype : ♀ ; SIERRA LEONE : Freetown, 1889 (Mocquerys) [ANSP].

Paratypes : ♀ ; GOLD COAST [EFG]. ♀ ; no locality data [EFG].

***Ethiopiochamus murinus* Gahan (*comb. nov.*)**

Monochamus murinus Gahan, *Ann. Mag. nat. Hist.* (6) **2**, 1888 : 394.

Monochamus murinus Gahan. Breuning, *Nov. Ent. suppl.* **3** (2), 1944 : 417.

MALE. Piceous. Head and pronotum densely cinereous pubescent, sometimes with a yellowish tinge ; the former with an irregular, brownish area on vertex. Elytra rather thinly cinereous pubescent, with scattered glabrous areas which sometimes are quite large, the pubescence condensed to form an irregular, rather narrow, transverse fascia at basal third and another much broader behind middle ; at base of each elytron with a small, transverse, dark brown macula from middle to scutellum. Scutellum entirely, but not very densely, cinereous pubescent. Beneath piceous, rather densely cinereous pubescent. Pro-, meso- and meta-sterna indistinctly brownish laterally ; the first four abdominal sternites each with a small, indistinct, brown macula laterally, largest on first sternite and decreasing in size on following segments. Legs piceous, cinereous pubescent. Antennae with scape piceous, remaining segments paler, thinly cinereous pubescent, dorsal pubescence tinged with brownish on third and fourth segments.

Head above minutely alutaceous, with a few coarse punctures in median longitudinal sulcus ; front slightly narrowed above lower margin of eyes, minutely alutaceous and with scattered coarse punctures, these also margin the lower lobe of eye ; eye with lower lobe nearly rounded, more than one-half again as tall as gena. Pronotum slightly narrower apically than at base, one-sixth again as wide at base as long ; lateral tubercles placed slightly behind middle, well elevated, and terminating in a short, blunt tooth ; apical sulcus broad, deep, recurved and widened at middle, basal sulcus narrow, moderately deep ; disk with three tubercles, basal one least prominent, but all well elevated, entirely coarsely, somewhat densely punctate as are the bases of the lateral tubercles. Elytra granulate-punctate on basal quarter,

the granules somewhat coalesced on humeri, thence to beyond middle coarsely, densely punctate, thence to apex (except laterally) punctures suddenly finer; apices broadly obliquely truncate. Antennae one and one-half times as long as body, very sparsely fimbriate on first four segments; scape robust, scarcely clavate, minutely punctulate and with coarse, shallow punctures, extending nearly to apical third of pronotum; third segment feebly arcuate, nearly uniformly swollen except at extreme base; fourth swollen, slightly tapering apically, one-fifth shorter than third; fifth much shorter than fourth, rest very gradually diminishing in length; eleventh slightly longer than tenth. Femora indistinctly punctate.

FEMALE. More robust than male; antennae defective, third and fourth segments robust, but not tumid; scutellum tinged with yellowish.

Length 22–26 mm.; width 7.5–8 mm.

Type locality: Senegal.

DISTRIBUTION: West Africa.

Sierra Leone: 1; no further locality data, Sept. 9 (Kroatz) [DEI].

Africa: 1; no further data [SM].

REMARKS. Easily recognized by the ashy pubescence which covers the entire body except the elytra, on which organs it is broken into irregular maculae.

***Ethiophochamus irrorator irrorator* Chevrolat (*comb. nov.*)**

Monohammus irrorator Chevrolat, *Rev. Mag. Zool.* 7, 1855: 517; *Cent. Long.*, 1858, No. 37.

Murray, *Ann. Mag. nat. Hist.* (4) 6, 1870: 479.

Monochamus irrorator Chevrolat. Breuning, *Nov. Ent. suppl.* 3 (2), 1944: 417.

? *Monohammus sparsutor* Chevrolat, *Rev. Mag. Zool.* 7, 1855: 518; *Cent. Long.*, 1858, No. 38.

Murray, *Ann. Mag. nat. Hist.* (4) 6, 1870: 475.

MALE. Dark reddish brown, elytra slightly paler; finely, not densely, grey pubescent. Head with a dark brown, triangular macula each side of middle. Pronotum and elytra irrorate with small, brownish, rounded maculae, on elytra denser and tending to become confluent at basal third, behind middle, and apical quarter. Scutellum medially with a large dark macula. Body beneath rather sparsely, finely, grey pubescent, distinctly sparser than on body above. Antennae and legs dark reddish brown; antennae from third segment, tibiae, and tarsi paler; entirely sparsely finely grey pubescent, apices of antennal segments from fourth darker pubescent.

Head above finely alutaceous, medially with a few coarse punctures; genae and front with scattered, coarse punctures, the latter quadrate, slightly narrowed between eyes; lower ocular lobe quadrate, twice as tall as gena. Pronotum feebly wider at base than long; lateral tubercles placed at middle, broad basally, ending in a short, obtuse tooth; basal and apical transverse sulci moderately deep, narrow, the latter recurved at middle; disk with five tubercles, the lateral basal ones very small, median one larger than the apical ones, with scattered, coarse punctures. Elytra on basal quarter with rather sparse, fine granules, thence punctures simple, seriate, the lateral ones coarse, more distinctly seriate; apices obliquely subtruncate. Antennae with middle of sixth segment attaining elytral apex, moderately fimbriate beneath on first four segments; scape slightly surpassing apex of prono-

tum, robust, gradually clavate, finely punctate, with a few coarse, shallow punctures interspersed; third segment subarcuate, feebly swollen, more than twice as long as first; fourth feebly swollen, one-fifth shorter than third; rest gradually shorter; eleventh wanting, probably elongate.

FEMALE. More robust; pronotum more strongly transverse; antennae only slightly longer than body, the apex of the eighth segment attaining elytral apex.

Length 15–18 mm.; width 4.7–5.8 mm.

Type locality: Old Calabar (*irrorator*; *sparsutor*).

DISTRIBUTION. West Central Africa.

Nigeria: 3; Old Calabar [BM].

Cameroons: 1; no further data [DEI]. 1; d'Ja Posten, May–July, 1936 (Merfield) [BM].

REMARKS. This species differs from *centralis* and its allies, first of all, in having the elytra irrorate with dark maculae, forming indistinct broken bands in places without a distinct, large, post-median spot. In the male the third and fourth antennal segments are not very swollen. Its body surface is red-brown, not fuscous or piceous, as are the antennae and tibiae and tarsi.

M. sparsutor is a possible synonym of the present form, but differs, according to the original description, in lacking the transverse macular bands on elytra, and in having the antennae "brown-black".

Ethiopiochamus irrorator cinerescens Jordan (*stat. nov.*)

Monohammus cinerescens Jordan, *Nov. Zool.* 1, 1894: 193.

Monochamus irrorator Jordan. Breuning, *Nov. Ent. suppl.* 3 (2), 1944: 417 [ex parte].

Differs from the nymotype in having the body colour black or piceous, as are the femora and scape. The bands on the elytra formed by the coalescence of the blackish small maculae tend to be more distinct.

Length 15.5–20.6 mm.; width 4.6–5.9 mm.

Type locality: Kuilu (Middle Congo).

DISTRIBUTION. French Equatorial Africa.

W. Africa: 1; no further data [BM].

Cameroons: 1; no locality data [NRS]. 3; Efulen, Dec., 1911 [CM]. 3; Edea, May–Dec. (Weber; Reis) [CM].

Gabon: 2; Ogowé River [CM].

Ethiopiochamus scabiosus Quedenfeldt (*comb. nov.*)

Monohammus scabiosus Quedenfeldt, *Berl. ent. Z.* 26, 1882: 338. Breuning, *Nov. Ent. suppl.* 3 (2), 1944: 418.

MALE. Piceous, elytra sometimes reddish brown. Head and pronotum grey pubescent; former with a dark vitta each side of middle, tapering anteriorly, and with scattered, fuscous maculae; pronotum with a small, elongate macula on median

discal tubercle and with scattered flecks especially apically, fuscous. Scutellum grey pubescent, with an oval brownish macula at apex. Elytra with grey and brown variegated pubescence, one or the other predominating, and with fuscous markings as follows: a more or less indistinct, transverse macula at scutellum, reaching just half across base, just behind middle a transverse macula attaining neither lateral nor sutural margin, rest of disk with scattered maculae, sometimes condensed on basal third and apical quarter, and below humerus a small macula. Body beneath piceous or dark reddish brown, second to fifth abdominal sternites paler, finely, rather densely grey pubescent. Legs and antennae piceous or dark reddish brown; antennae from third segment reddish to yellowish brown, sparsely tawny pubescent, bases of segments more greyish pubescent; legs sparsely grey pubescent, tibiae and tarsi with surface reddish or yellowish brown.

Head above with a few moderately coarse punctures in a series each side of median line; front scarcely transverse, feebly narrowed between eyes, with coarse, scattered punctures; eyes with lower lobe subquadrate, not quite twice as tall as gena. Pronotum slightly wider at base than long; lateral tubercles placed slightly behind middle, broad, ending in a short, obtuse spine; apical and basal sulci narrow, deep medially, the former recurved at middle; disk moderately, not densely punctate, punctures apical to anterior sulcus larger, with five tubercles, the anterior two largest, the lateral basal ones smallest. Elytra on basal quarter granulate-punctate, punctures thence simple, seriate, those toward sides coarser and more regularly seriate; apices broadly truncate. Antennae nearly twice length of body, rather sparsely fringed beneath to the end of fourth segment; scape attaining apical third of pronotum, robust, only feebly clavate; third segment feebly arcuate, nearly uniformly swollen throughout its length, twice as long as scape; fourth slightly tumid, about one-half longer than first; rest gradually shorter, except eleventh, which is nearly as long as third.

FEMALE. Usually more brown pubescent; pronotum more strongly transverse; scutellar macula larger; antennae with middle of ninth segment attaining elytral apex, third segment not swollen; segments from fourth more distinctly annulate at base.

Length 14–20.6 mm.; width 4.3–6.9 mm.

Type locality: Angola.

DISTRIBUTION. West and Central Africa.

Uganda: 2; Entebbe [EFG].

Angola: 3; no further data [BM].

Belgian Congo: 5; Stanleyville (Ertl) [ZSM-4; NRS-1]. 2; Banana (Hesse III) [SM]. 1; Kasai, Kondué (E. Luja) [NRS]. 1; Eala [NRS].

French Congo: 1; Mongoumba, Feb. 5, 1930 [SM].

Gabon: 1; Lambaréné [CM]. 1; no further data [NRS].

Gold Coast: 1; no further data [SM].

REMARKS. More largely grey pubescent and variegated broadly on its elytra with brown; legs and antennae pale reddish or yellowish as follows: the former from the tibiae, the latter from the middle of third segment; elytra with basal macula small, indistinct, near scutellum only.

The Eala specimen has only a few fine maculae in place of the large post-median spot on elytra (*dissolutus*).

The two specimens from Uganda in E. F. Gilmour's collection have the post-median elytral macula considerably smaller than in other examples and may eventually prove to represent a distinct subspecies.

***Ethiopiochamus ruficornis* Hintz (*comb. nov.*)**

Monohammus ruficornis Hintz, *Dtsch. ent. Z.* 1913 : 198.

Monochamus plumbeus Gahan. Breuning, *Nov. Ent. suppl.* 3 (2), 1944 : 418 [misdet.].

MALE. Piceous to black, elytra sometimes a little paler, rather densely covered with dingy grey pubescence. Head above with an elongate, triangular, fuscous macula either side of middle, becoming brownish anteriorly. Pronotum and elytra irrorate with small, fulvous, dark brown or fuscous maculae; elytra with several larger maculae, including an irregular, subquadrate macula or band just behind middle, and a few, often forming an indistinct band, at basal third; at base each side of scutellum an arcuate, fuscous macula. Scutellum cinereous pubescent, usually with a brown or fuscous spot medially. Body beneath and legs more sparsely grey pubescent, the latter often entirely, or with tibiae and tarsi, reddish. Antennae piceous, frequently with segments from third reddish brown, dull brownish ashy pubescent, bases of segments from fourth irregularly annulate with cinereous.

Head minutely alutaceous, above with a few coarse punctures at middle; genae and front with sparse, coarse punctures; latter distinctly transverse, constricted between eyes; eye with lower lobe subquadrate, nearly twice height of gena. Pronotum about one-third again as wide across base as long; lateral tubercles prominent, robust, medial, with a short, obtuse spine at apex; apical and basal transverse sulci irregular, the former recurved at middle, the latter deep medially but shallow laterally; disk with five distinct tubercles, the lateral basal ones somewhat smaller, the median one the largest, coarsely punctate medially and towards apex. Elytra rather densely, uniformly granulate-punctate on basal fifth, thence simply, seriatly, rather sparsely punctate to apex, the more lateral punctures coarser and more regularly seriate; apices obliquely, rather broadly subtruncate. Antennae nearly twice as long as body, sixth segment surpassing elytral apex, fimbriate beneath on first four segments; scape attaining apical third of pronotum, rather robust, feebly clavate apically; third segment as long as first; fourth feebly swollen, slightly longer than first; remainder gradually shorter, except eleventh, which is a little longer than third.

FEMALE. More robust; pronotum more strongly transverse; antennae slightly longer than body, ninth segment surpassing elytral apex, third and fourth segment not swollen, eleventh scarcely longer than tenth.

Length 16.5–25 mm.; width 5.3–8.4 mm.

Type locality : Kondué [Belgian Congo].

DISTRIBUTION. Broadly through Central Africa into Nigeria.

Nigeria : 1; Itu [EFG].

Cameroon: 1; no further locality [SM]. 6; Efulen [CM]. 1; Sakbayeme, Sanaga River, July [CM]. 4; Mundame [DEI-2; MCZ-1; SM-1]. 1; Yaounde, July-August [CM]. 1; Bipindi, May-June [CMNH]. 1; Victoria [SM].

Gabon: 2; Ogoewe River [CM].

Belgian Congo: 1; Djabbir, May-June [BM]. 1; Duma, Ubangi Dist., Oct. 7, 1910 (Schultz) [SM].

REMARKS. Distinguished from *irrorator* by its larger and more robust body, by the less densely irrorate elytra, and especially by the large, subquadrate, post-median, dark macula on the elytra. The colour of antennae and legs appears to vary from dark to light reddish brown. Two groups are readily separated, in one the tarsi are red, in the other they are black, but as no other differences appear to be constant, these colour differences are treated as individual variations.

***Ethiophochamus centralis* Duvivier (*comb. nov.*)**

Monohammus centralis Duvivier, *Ann. Soc. ent. Belg.* **35**, 1891: 380; loc. cit. **36**, 1892: 343.

Monochamus plumbeus ab. *centralis* Duvivier. Breuning, *Nov. Ent. suppl.* **3** (2), 1944: 418.

MALE. Head and pronotum piceous to black, elytra dark reddish brown to piceous; covered densely with brown-grey to grey pubescence. Head each side of middle with an irregular, vittiform macula of dark brown pubescence. Pronotum apically with small, scattered, dark brown maculae. Scutellum with an indefinite, poorly visible, brownish macula medially. Elytra with dark brown marking as follows: extreme base with a transverse macula extending from scutellum to near humerus, usually divided into a smaller and a larger part; at basal quarter with an irregular macula, often represented by several very small maculae; just behind middle an irregular macula, more or less quadrate; entire surface irregularly and inconstantly sprinkled with fine points. Body beneath and legs castaneous, densely covered with pubescence that is somewhat greyer than that of body above; abdomen with first three sternites having a brownish macula laterally; tarsi grey pubescent. Antennae with scape piceous, rest dark reddish brown, becoming paler to apex; brown-grey pubescent, segments a little greyer on bases beneath.

Head minutely alutaceous, vertex medially with a few coarse punctures; front slightly wider than tall, sides subparallel, a little narrowed between eyes, with a few scattered punctures; eye with lower lobe subquadrate, ranging from one-third to one-half again as tall as gena. Pronotum about one-fifth again as wide across base as long; lateral tubercles medial, broad at base, ending in a rather short, obtuse spine; apical and basal transverse sulci rather broad, basal one rather shallow, the apical one recurved and deeply impressed medially; disk with five tubercles, the lateral ones much smaller than others, with scattered, coarse punctures. Scutellum transverse, more or less triangular, rounded at apex. Elytra smooth at extreme base, basal quarter with moderate-sized granules, thence with more or less seriate punctures to apex, the more lateral rows usually more distinct; apices broadly truncate. Antennae nearly twice as long as body, fimbriate beneath on first four segments; scape not quite attaining base of lateral tubercles, gradually clavate to apex; third segment feebly arcuate, swollen throughout its length, three-quarters again as long

as first ; fourth straight, feebly swollen, nearly half again as long as first ; fifth segment subequal to first ; rest gradually shorter, except eleventh which is elongate.

FEMALE. Antennae very little longer than body, the last segment feebly longer than tenth ; pronotum more strongly transverse.

Length 22-30.5 mm. ; width 7-10 mm.

Type locality : Ibembo, Congo.

DISTRIBUTION. Throughout the tropical rain forest area.

Uganda : 1 ; Mengo [BM] 1 ; Bugalla Isl., Lake Victoria, Jan. 23, 1912 [BM].

Belgian Congo : 3 ; Itemburi, Itembo, Aug.-Oct., 1890 (Duviv.) [BM-2 ; SM-1].

1 ; Luluabourg, 1930 [EFG]. 3 ; Kondué (Luja) [SM].

French Congo : 1 ; Kuilu (Mocquerys) [BM].

Cameroons : 1 ; no further data [SM]. 6 ; Efulen, Aug.-Dec. [CM]. 1 ; Sakbayeme, Sanaga River (Reis) [CM]. 4 ; Mundame [SM].

Nigeria : 1 ; Ilesha (Humphrey) [BM].

Gold Coast : 3 ; no further data [BM-2 ; EFG-1]. 1 ; Abuvi [EFG]. 2 : Abboa Dist. [BM : EFG]. 1 ; Juaso, Oct. 26, 1938 (G. S. Cansdale) [BM].

REMARKS. The specimens from the Gold Coast have a very short tooth on the pronotal lateral tubercles and on the Nigerian example the basal macula on the elytra is broader than usual and unbroken.

Most easily recognized from related species by the fulvous pubescent under-surface, and by the abdomen maculate with fuscous laterally on first three or four sternites.

Ethiopiochamus plumbeus Gahan (*comb. nov.*)

Monohammus plumbeus Gahan, *Ann. Mag. nat. Hist.* (6) 2, 1888 : 394.

MALE. Fuscous, densely covered with brownish grey pubescence. Head above feebly tinged with fuscous on occiput and either side of middle ; front below and genae more or less cinereous pubescent. Scutellum uniformly brown-grey pubescent. Elytra more strongly brown-grey pubescent, becoming more cinereous on sides, at extreme base near scutellum a transverse, fuscous macula extending half-way to humeri, with a small spot between it and humerus, behind middle with an irregular, fuscous macula often broken into small maculae ; below humerus a small, quadrate macula of same colour, rest of elytra nearly entirely free of dark flecks except for a few at basal third. Body beneath and legs dark reddish brown, pale brown-ashy pubescent ; tarsi hoary pubescent. Antennae fuscous, segments becoming dark reddish brown apically, rather densely, uniformly covered with grey-brown pubescence.

Head minutely alutaceous, between eyes and antennal tubercles with a number of irregular-sized punctures ; front distinctly wider than long, strongly narrowed between eyes, with scattered, coarse punctures ; eyes with lower lobe subquadrate, twice height of gena. Pronotum scarcely wider across base than long ; lateral tubercles prominent, robust, with a short, obtuse tooth at apex, directed slightly posteriorly ; apical and basal sulci rather shallow, more distinct medially, apical one recurved at middle ; disk with five tubercles, the lateral basal ones subobsolete, rest

prominent, with a cluster of rather coarse punctures either side of middle and a few finer ones laterally. Elytra on basal quarter granulate-punctate, the granules only slightly prominent, punctures thence simple, seriate, the lateral ones rather coarse, those towards suture much finer; apices broadly, squarely truncate. Antennae about two-thirds again as long as body, fimbriate beneath on first four segments; scape attaining apical fourth of pronotum, robust, feebly clavate apically; third segment twice as long as scape, distinctly arcuate, moderately, uniformly swollen throughout its length; fourth feebly tumid, about half again as long as first; remainder gradually shorter, except eleventh, which is slightly longer than fourth.

Length 24 mm.; width 7.8 mm.

Type locality: Congo.

DISTRIBUTION. West Central Africa.

French Congo: 1, Kuilu River [ANSP].

REMARKS. This species is distinct in its uniform pubescence, having on the elytra very few dark flecks except at basal third, and no dark flecks on the pronotum or scutellum.

Ethiopiochamus tropicalis sp. n.

MALE. Fuscous to piceous, densely covered with fulvous and hoary variegated pubescence, maculate with fuscous or piceous as follows: Head above with an elongate, triangular macula each side of middle. Pronotum with a small macula on each of the three basal discal tubercles, that on the middle one sometimes elongate; a small macula on anterior surface of tubercle. Elytra with a broad basal area, not sharply defined posteriorly; behind middle a large, quadrate macula, rest of disk irregularly sprinkled with small maculae, especially near basal third and along suture. Scutellum ashy pubescent with a fulvous-brown, oval macula medially. Body beneath and legs dark reddish brown to fuscous, rather sparsely covered with brownish cinereous pubescence; tarsi cinereous pubescent. Antennae with scape piceous, remaining segments dark reddish brown, sparsely covered with brownish cinereous pubescence, segments from fourth sometimes grey annulate, sometimes only grey beneath.

Entire upper surface minutely alutaceous. Head with a single series of punctures each side of median line; front irregularly, rather coarsely, sparsely punctate, especially medially and near eyes, one-fourth wider than high, slightly constricted between eyes; eye with lower lobe quadrate, twice as high as gena. Pronotum one-fourth again as wide across base as long; lateral tubercles median, broad at base, subconical, ending in a short, obtuse spine; apical and basal transverse sulci rather narrow, deep, but irregularly impressed, apical one strongly recurved medially; disk with five distinct, nearly equally elevated tubercles, the two lateral posterior ones slightly smaller than others; surface irregularly sprinkled with moderately fine punctures, especially anteriorly at middle and on lateral tubercles. Elytra finely, seriatly punctate, punctures at extreme base more or less granulate, usually not very distinct along suture; apices broadly or rather broadly, slightly obliquely truncate, sometimes somewhat emarginately truncate. Antennae one and two-

thirds body length, fimbriate beneath on first four segments; scape attaining apical fourth of pronotum, gradually clavate to apex; third segment swollen, feebly biflexuose, three-fourths again as long as first; fourth robust, slightly longer than first; remaining gradually decreasing in length, except eleventh which is subequal to third.

FEMALE. Antennae only slightly longer than body, eleventh segment a little longer than tenth. Pronotum somewhat more transverse than in male.

Length 18–24 mm.; width 7–8 mm.

Holotype: ♂; FRENCH EQUATORIAL AFRICA: Brazzaville (E. Bourval) [ANSP].

Allotype: ♀; same data as holotype [ANSP].

Paratypes: 7; topotypic [ANSP-6; NRS-1]. 1; Congo; [NRS].

REMARKS. Easily distinguished from *centralis* in having on the elytra a broad brown basal area that fades into the paler pubescence. The pubescence of the entire upper surface is variegated, being made up of fulvous and hoary pubescence; the scutellum is ashy, with fulvous-brown maculae. Furthermore, the pronotum has across its base three dark brown maculae in a row; and the elytral post-median macula reaches very nearly to extreme lateral margin.

Ethiopiochamus nubifer Gyllenhal (*comb. nov.*)

Lamia nubifer Gyllenhal, in Schoenherr, *Syn. Ins.* 1, 3, 1817: append. 165.

Monochamus gabonicus Thomson, *Arch. Ent.* 2, 1858: 166.

Monohammus ruspator Fabricius. Murray, *Ann. Mag. nat. Hist.* (4) 6, 1870: 475. Aulmann, *Fauna Deutsch. Kolon.* 5 (3), 1912: 17, f. 13; 5 (5), 1913; 19, f. 15. Breuning, *Nov. Ent. suppl.* 3 (2), 1944: 421.

Monohammus basalis Chevrolat, *Rev. zool.* (2) 9, 1857: 74; *Cent. Long.*, 1858, No. 65. Murray, *Ann. Mag. nat. Hist.* (4) 6, 1870: 476.

Monochamus feralis Pascoe, *Trans. R. ent. Soc. Lond.* (3) 3, 1866: 296 [*vide* Breuning].

MALE. Head and pronotum piceous, densely covered with short, dull brown or dull brownish fulvous pubescence. Scutellum dull ochraceous pubescent. Elytra dark brown pubescent, with a broad, common, irregular, more or less X-shaped area of whitish pubescence extending from humeral angle to slightly behind middle at sides, the anterior arms and the median portion usually broader than the posterior and often interrupted with small brown maculae; at apical quarter an undulating, narrow fascia of similarly coloured pubescence, attaining both lateral and sutural margins, and with indistinct whitish maculae bordering the entire apical margin; humeri anteriorly tinged with yellowish. Body beneath and legs sparsely covered with brownish fulvous pubescence; tarsi cinereous pubescent. Antennae with scape piceous, rest dark reddish brown, gradually becoming paler apically, uniformly covered with sparse dull ashy pubescence, without annulations.

Head around eyes and on front with a few rather coarse punctures; front about one-fifth wider than long; eye with lower lobe oblong, suberect, about two and one-quarter times the height of gena. Pronotum at base one-seventh wider than long; lateral tubercles robust, prominent, terminating in a short, robust, obtuse spine; disk with three low, rounded tubercles, median one a little larger and more prominent than the others, sprinkled with rather coarse, irregularly placed punctures,

especially towards sides and before apex ; apical sulcus rather broad, deep, strongly recurved medially, basal one narrow, deep, and more or less undulating. Elytra with basal gibbosity feeble, without trace of a crest ; entire surface rather finely, densely punctate, the punctures somewhat finer apically, usually preceded by five granules at extreme base ; humeri simply rounded ; apices broadly subtruncate, outer angle sometimes feebly produced. Antennae robust, nearly twice as long as body, finely and rather densely fringed beneath to apex ; scape scarcely surpassing the apex of pronotum, robust from base ; third segment nearly twice as long as first ; fourth one-half again as long as first ; fifth longer than first ; rest gradually decreasing in length, except eleventh, which is as long as fourth and slightly arcuate.

FEMALE. As in male, but antennae feebly annulate from fourth segment, one-fourth again as long as body, fourth segment only slightly longer than first and fifth subequal to first, eleventh scarcely longer than tenth.

Length 15-26 mm. ; width 5-7.7 mm.

Type locality : Sierra Leone [*nubifer*] ; Gabon [*gabonicus*] ; Flores [*feralis*].

DISTRIBUTION. West Central Africa.

Cameroons : 13 ; no further data [MCZ ; SM ; DEI ; ZSM]. 21 ; Efulen, June-Dec. [CM]. 8 ; Lolodorf [CM ; SM]. 5 ; Batanga [CM]. 2 ; Edea [CM]. 2 ; Yaunda [CM]. 1 ; Sakbayeme [CM]. 2 ; Ogové River [CM]. 10 ; Mundame [MCZ ; SM]. 2 ; Motive [SM]. 1 ; Momfe [SM]. 1 ; Mukonje [ZSM]. 1 ; Tiko [DEI]. 1 ; Longji [ZSM]. 1 ; Bipindi [CMNH]. 1 ; Joko [SM]. 1 ; Victoria [ANSP]. 1 ; Sasse, nr. Buea, Feb. 1951 [CAS]. 2 ; Mabete, Victoria, June 1, 1946 (Malkin) [CAS]. 1 ; Muyuka, Victoria, June 24 (Malkin) [CAS].

Gabon : 10 ; no further data [CM ; ANSP ; MCZ ; DEI].

French Congo : 1 ; Kuilu River [ANSP]. 1, Brazzaville [ANSP]. 1 ; Jaunde [EFG].

Nigeria : 1 ; Calabar [SM]. 1 ; Anambra Creek, Lower Niger [EFG].

REMARKS. This species is easily recognized by the dark basal patch of the elytra, which is followed by a broad, irregular, X-shaped area of whitish pubescence, and by the lack of a basal crest.

Ethiopiochamus nubilosus Hintz (*comb. nov.*)

Monohammus nubilosus Hintz, *Wiss. Ergebn. Deutsch. Zentr.-Afr. Exp.* 3, 1911 : 434.

Monochamus ruspator dentipes Gyllenhal. Breuning, *Nov. Ent. suppl.* 3 (2), 1944 : 421 [misdet.].

"Fawn, dark clouded, grey or fuscous nubilose, yellow pubescent. Head and pronotum very densely finely punctate, with scattered, deep punctures interspersed. Pronotum not longer than wide, disk trituberculate, yellow maculate. Scutellum yellow pubescent. Elytra with apices squarely truncate, angles rounded, between scutellum and humeri slightly elevated, base granulate, thence strongly punctate, punctures finer apically. Body beneath very densely punctate. Antennae of male twice length of body, in female surpassing elytral apex, brown segments apically darker. Length 19-23 mm.

"1; Foot of Ruwenzori Mt., Feb. 1; Kassenje, Lake Albert, Feb., 1908. 1; Bukoba, June 13, 1907.

"Head entirely sulcate medially. All tibiae dentate at apex" [Translation of the original description].

This species appears to be closely related to *E. ruspator* Fab. but was not encountered during the present study.

***Ethiopiochamus ruspator* Fabricius (*comb. nov.*)**

Lamia ruspator Fabricius, *Spec. Ins.* 1, 1781: 223; *Man. Ins.* 1, 1787: 140; *Ent. Syst.* 1 (2), 1792: 286; *Syst. Eleuth.* 2, 1801: 300. Gmelin, in Linné, *Syst. Nat.*, ed. 13, 1 (4), 1790: 1834. *Cerambyx ruspator* Fabricius. Olivier, *Encycl. meth. Ins.* 7, 1792: 467; *Entomologie.* 4, No. 67, 1795: 99, pl. 17, f. 129.

MALE. Piceous, rather densely covered with dark greyish brown pubescence. Head on vertex, and pronotum over lateral and discal tubercles, covered with brownish ochraceous pubescence. Scutellum entirely ochraceous pubescent. Elytra with humeri irregularly ochraceous pubescent, the pubescence extending in a narrow oblique vitta to about basal fifth; with two whitish fasciae, one slightly behind middle, broadly interrupted before suture, extending obliquely forward from sides, continued at suture as a common macula, the second at apical fourth, narrow, undulating, widened near suture. Body beneath and legs dark reddish brown, abdomen sometimes paler, densely clothed with greyish pubescence, interrupted by small, glabrous points; metasternum and legs beneath tinged with brownish pubescence. Antennae with scape piceous, rest dark reddish brown, becoming slightly paler distally, finely grey pubescent, apical halves of segments with brownish pubescence.

Head minutely alutaceous, with scattered, coarse, deep punctures, front one-fifth wider than high, slightly narrowed between eyes; eye with lower lobe broadly oval, twice as tall as gena. Pronotum one-quarter again as wide across base as long; apical and basal transverse sulci deep, apical one recurved medially; lateral tubercles broad, ending in a short, obtuse spine; disk with five tubercles, the median one placed closer to base and broad, the two lateral ones feeble, entire surface coarsely, densely, irregularly punctate. Elytra with basal gibbositities feeble; disk on basal fifth moderately granulate-punctate, thence with moderate sized, deep punctures which are more or less seriate; apices obliquely truncate. Legs with femora coarsely, rather sparsely punctate. Antennae about one and two-thirds times as long as body, fimbriate beneath to apex; scape robust, very feebly clavate apically, with coarse, deep, sparse punctures; third segment straight, twice as long as scape; fourth segment one-half and fifth one-third again as long as first; rest gradually diminishing, except eleventh which is as long as fourth and arcuate.

FEMALE. As male but antennae only one-third longer than body, and third segment is not quite twice as long as first.

Length 16-21 mm.; width 5-7 mm.

Type locality: "Africa aequinoctiali" [*ruspator*].

DISTRIBUTION. West Africa, from Nigeria to Liberia.

West Africa : 12 ; no further data [EFG ; ZSM].

Nigeria : 1 ; no further data [SM]. 1 ; Ifon, Ondo Prov., Aug. 1-11, 1934 (Bolton) [CMNH]. 1 ; Lagos [EFG]. 1 ; Calabar [SM].

Gold Coast : 9 ; no further data [EFG-8 ; SM-1]. 1 ; Tafo [EFG]. 3 ; Obuasi, Mar. (D. Rafferty) [CM]. 1 ; Accra, March [EFG]. 2 ; Axim [EFG ; USNM]. 1 ; Ashanti [ANSP].

Togo : 2 ; no further data [SM].

Ivory Coast : 1 ; Dimbroko [EFG].

French Guinea : 2 ; no further data [ZSM].

Liberia : 1 ; no further data [MCZ]. 1 ; Du River [MCZ]. 14 ; Mt. Coffee [USNM]. 2 ; Muhlenberg Mission [USNM]. 1 ; Harbel, April 1946 (H. Beatty) [LL]. 1 ; Medje (Lang & Chapin) [AMNH].

Gabon : 1 ; no further data [SM].

Cameroons : 4 ; no further data [SM].

Belgian Congo : 1 ; Niangara, Nov., 1910 (Lang & Chapin) [AMNH].

German East Africa : 1 ; no further data [ZSM].

REMARKS. This species (under the name of *dentipes*) was treated by Breuning as a variety of *nubifer* (which he called *ruspator*). The present form is amply distinct, however, by the coarse punctuation of the femora and scape, by the shorter, robust body form, and by the transverse pronotum, as well as by the elytral and pronotal maculation.

Fabricius in his original description of *ruspator* states "Thorax spinose, fuscous, with two ferrugineous maculae, elytra fuscous varied with ashy . . . and antennae slightly longer than body." These statements can apply only to the above species.

Ethiopiochamus ochraceomaculatus Breuning (*comb. nov.*)

Monochamus ochraceomaculatus Breuning, *Folia zool. hydrobiol. Riga* 7, 1935 : 245 ; *Nov. Ent. suppl.* 3 (2), 1944 : 422.

"Close to *ruspator* Fab. but : Head more sparsely, pronotum more finely, punctate, scutellum brown tomentose, yellow only on the margins, the brighter markings of elytra as in *ruspator* m. *nubifer* Gyll., but more sharply defined, of ochraceous yellow colour, the premedian oblique band widened toward the suture, extending basally almost to the scutellum. Body beneath, legs, and antennae brown-grey tomentose. 20-27 mm. Type 1 ♀ from Belgian Congo : Kasai in the Museum of Tervueren. Distributed as far as Gabon."

REMARKS. It is impossible to determine the generic position of this species without examining the type, but its coloration indicates it possibly will fall here.

NEOCHAMUS gen. n.

Moderate to large, cylindrical forms, with head of moderate length ; front not retracted, transverse, slightly narrowed between eyes ; eye with lower lobe oblong or subovate, subequal to the gena in height, isthmus at least half as wide as an upper lobe, upper lobes separated by about one and one-half to two times one of

their widths ; antennal tubercles subapproximate at base, apically strongly divergent, prominent. Pronotum feebly narrowed apically, sides nearly straight, one-fourth again as wide at base as long ; lateral tubercles median, moderately elevated, ending in a short, subacute spine ; disk with five tubercles, with basal and apical transverse sulci shallow, broad, the apical one recurved medially, not forming a deep impression medially, the surface varying from very sparsely to moderately densely punctate. Elytra on basal gibbosity with a feeble crest which is sometimes granulate ; disk granulate-punctate on no more than basal fifth, the rest of surface simply punctate, the punctures more or less confused ; humeri with a small tubercle at angle ; apices either separately rounded or broadly truncate ; sides feebly tapering in male, arcuately narrowed from behind middle in female. Prosternum simple, one-sixth to one-fourth as broad as procoxal cavity, mesosternal process simple, one-fourth to one-third as broad as mesocoxal cavity, apex subtruncate. Legs moderately long, hind ones longest in males ; metafemora attaining at least middle of fifth sternite in male, all femora subcylindrical, slightly thickened medially ; tibiae subequal to femora, unarmed ; protarsi only slightly dilated in male. Antennae at least twice body length in male, and one-third longer than body in female, beneath fringed to base of fourth or fifth segment ; scape short, extending at most to apical fourth of pronotum, robust, gradually thickened from base to apex, cicatrix extending nearly two-thirds around apical margin, moderately wide, slightly wider laterally ; third segment robust in male, straight or nearly so, nearly three-fourths again as long as first or longer ; fourth rather robust, it and following subequal, eleventh a little longer.

Type species : *Monohammus nyassensis* Gahan.

REMARKS. This genus is close to *Ethiopiochamus* but differs from it in the eyes being smaller and more widely separated above. In addition, the elytra have a feeble crest and the humeri a small tubercle at the angle, the scape is short and conical, not flared apically and the third segment is nearly straight, robust, not tumid in male.

KEY TO SPECIES

1. Elytra with median fascia bordered before and behind with a narrow white fascia or traces of such a fascia ; scutellum with pale margin less than one-third as wide as central fuscous area ***pannulatus***
 Elytra with median fascia not margined before and behind with white ; scutellum with pale margin at least half as wide as central fuscous area 2
2. Pronotum only with several punctures medially at apex, rest of disc impunctate ; elytra with crest in profile not serrate ***thoas***
 Pronotum nearly uniformly punctate throughout ; elytral crest serrate in profile 3
3. Head, pronotum, and most of elytra uniformly pale grey pubescent ***pheretes***
 Head, pronotum and elytra not bright grey pubescent ***nyassensis***

Neochamus nyassensis nyassensis Gahan (comb. nov.)

Monohammus nyassensis Gahan, *Ann. Mag. nat. Hist.* (6) **2**, 1888 : 395.

Monochamus pannulatus Quedenfeldt. Breuning, *Nov. Ent. suppl.* **3** (2), 1944 : 428 [misdet.]

MALE. Piceous to black, densely covered with short, fulvous-ashy pubescence ; head dull brownish pubescent, sometimes tinged with ochraceous between and

around eyes. Pronotum dull brown pubescent, irregularly varied with fulvous on discal and lateral tubercles. Scutellum fuscous pubescent, more or less broadly margined with fulvous pubescence. Elytra fulvous-ashy pubescent, mottled with irregular blackish maculae to a greater or lesser extent, at base with a broad, common, fuscous area, at suture extending to basal fourth, not quite attaining humeri on sides, its posterior margin irregularly incised each side and quite variable in outline; beginning at middle of sides an oblique, dark brown or fuscous band, which usually narrows somewhat towards suture. Body beneath and legs dark brown, silky pubescent; tarsi and sometimes tibiae ashy or fulvous; femora with sparse, single, white setae. Antennae black at base, becoming reddish brown apically, ashy pubescent, pubescence only slightly denser on bases of segments.

Entire upper surface minutely alutaceous. Head with scattered, moderate-sized, deep punctures; eye with lower lobe slightly erect, about one-fourth again as high as gena. Pronotum at base one-third wider than long; lateral tubercles broad basally, acute, and with an acute spine at apex; disk rather uniformly but sparsely, moderately punctate, with five tubercles, two before and three behind middle, the median one distinctly larger than the rest, the other two basal ones feeble; the single apical and basal sulci broad, shallow. Elytra at base rather densely, finely granulate-punctate, the punctures becoming simple beyond basal dark area and gradually sparser to apex; at middle of each base a low crest bearing two or three tubercles, the most basal of which is much the larger; apices broadly, separately rounded or obliquely subtruncate at suture. Antennae more than twice as long as body, finely fimbriate beneath on first three or four segments; scape extending just to base of lateral tubercles, robust, subconical; third segment three-fourths again as long as first.

FEMALE. As in male, but antennae only one-third again as long as body, fourth segment scarcely longer than first, rest gradually shorter.

Length 17–23 mm.; width 6–8 mm.

Type locality: Nyassa.

DISTRIBUTION. South Central Africa.

Nyasaland: 12; no further data [EFG; BM]. 19; Mlanje, Dec.–Jan., 1913 [EFG; BM]. 1; Mt. Mlanje, Jan. 1, 1913 (S. A. Neave) [BM].

Southern Rhodesia: 1; Mt. Chirindi [EFG]. 1; Mashonaland [EFG]. 1; Mt. Selinda, Dec. 1929 [CM]. 1; Chirinda Forest [NMSR].

Belgian Congo: 1, Urundi [ZSM].

(?) Cameroons: 1; no further data [SM].

Neochamus nyassensis proximus Breuning (*stat. nov.*)

Monochamus proximus Breuning, *Folia zool. Hydrobiol. Riga* 7, 1935: 246; *Nov. Ent. suppl.* 3 (2), 1944: 428.

Monochamus pannulatus Quedenfeldt. Aurivillius, in Sjöstedt, *Wiss. Ergebn. Exped. Kili-mandjaro*, 1 (7), 1908: 146 [misdet.].

As the nymotype, but elytra with pubescence fulvous instead of fulvous ashy; scutellum largely pale fulvous with a basal dark brown macula; body beneath

slightly fulvous pubescent. Elytral apices usually broadly, obliquely truncate at suture, the outer angle pronounced.

Type locality : Lindi, Tanganyika.

DISTRIBUTION. East Africa.

Tanganyika : 6 ; Lukuledi [ZSM].

***Neochamus nyassensis gazensis* subsp. n.**

As in the nymotype but scutellum entirely yellowish white pubescent, sometimes with a touch of dark at extreme base ; antennae sharply and broadly grey annulate on bases of segments from the third in both sexes.

Length 17.5–19 mm. ; width 6.3 mm.

Holotype : ♂ ; SOUTHERN RHODESIA : Gazaland, Chirinda Forest, Dec., 1901 (G. A. K. Marshall) B.M. 1912–296 [BM].

Allotype : ♀ ; same data as male [BM].

Paratypes : 3 ; Chirinda Forest, Gazaland, Dec., 1937 (G. van Son) [Fuchs].

***Neochamus pheretes* sp. n.**

MALE. Head and pronotum piceous, covered with greyish brown pubescence, varied somewhat with cinereous, or sometimes entirely cinereous pubescent. Scutellum brownish ochraceous or whitish pubescent. Elytra brown-ochraceous pubescent, at base with a common, transverse, dark brown area widest at suture, narrowing to humerus ; two oblique fasciae of cinereous pubescence, one before middle, narrow, one behind middle somewhat wider, fasciae sometimes composed of white annulae about the punctures ; apical quarter usually more or less reticulate with cinereous. Body beneath dark reddish brown, covered with greyish brown and cinereous pubescence. Legs and antennae dark reddish brown ; femora above greyish brown pubescent, lower surface, tibiae, and tarsi cinereous ; antennae annulate with greyish pubescence basally, beginning with third segment.

Head minutely, densely alutaceous, with a few scattered, coarse, deep punctures ; front feebly transverse, with scattered, coarse, deep punctures ; eye with lower lobe slightly shorter than gena, ovate. Pronotum one-fourth again as wide at base as long ; basal and apical sulci broad, shallow, the latter recurved medially ; lateral tubercles broad, moderately elevated, ending in a short, subacute spine ; disk with five tubercles, the median one basal, very large, the two each side of middle rather small, the anterior pair slightly larger, entire surface sparsely coarsely punctate. Elytra basally with a crest medially, along the apex of which is a series of coarse tubercles, the largest one anteriorly ; basal fifth moderately granulate-punctate, rest of elytra somewhat coarsely punctate, more finely so toward apex ; humeri at angle with a small, rounded tubercle ; apices rather narrowly rounded. Antennae largely wanting ; scape robust, finely, densely punctate, attaining anterior border of lateral tubercle ; third segment nearly straight, rather robust, twice as long as first ; rest wanting.

FEMALE. As in male but more robust ; antennae shorter, third segment a little

more than half again as long as first ; fourth segment one-fourth longer than first, and fifth slightly shorter than first ; rest wanting.

Length 16.3–18 mm. ; width 5.2–5.9 mm.

Holotype : ♂ ; SOUTHERN RHODESIA : Vumba, Mar. 1931 [NMSR].

Allotype : ♀ ; same data as holotype [NMSR].

Paratype : ♀ ; SOUTHERN RHODESIA : Vumba, Umtali district, Feb. 19, 1931 (P. A. Sheppard) [NMSR].

REMARKS. The paratype is nearly entirely cinereous pubescent above on head and pronotum and the anterior cinereous pubescent fascia is much broader. The scutellum is also whitish pubescent.

The species is close to *N. nyassensis nyassensis* but there the pubescence of the upper surface is tawny, not varied with ashy. In the present form the pronotum is less densely punctate as well. Furthermore the lower lobe of the eye is shorter than the gena. Eventually it may prove to be a race of *N. pannulatus*, but no intermediate forms were found to warrant such action here.

***Neochamus pannulatus pannulatus* Quedenfeldt (*comb. nov.*)**

Monohammus pannulatus Quedenfeldt, *Berl. ent. Z.* **26**, 1882 : 337.

FEMALE. Dark reddish brown, fulvous pubescent. Head mottled with dark brown on occiput and front. Pronotum medially tinged with fuscous. Scutellum dark brown pubescent, rather broadly margined with ochraceous. Elytra ashy pubescent, at base with a broad, common, subtriangular, fuscous area, irregularly incised on its posterior border ; entire disk heavily mottled with blackish ; medially a broad, oblique, fulvous band extending to suture and a small, fulvous area on apex. Body beneath and legs fulvous pubescent, with single, scattered, long, whitish hairs. Antennae gradually paler apically ; fulvous pubescent, segments from fourth more or less distinctly annulate with whitish.

Entire upper surface minutely alutaceous. Head finely punctate above between eyes and on front, more coarsely and sparsely so on genae behind eyes ; eye with lower lobe erect, subequal to gena in height. Pronotum at base about one-fourth again as wide as long ; lateral tubercles broad, obtuse, armed with a robust, subacute spine ; disk rather densely, moderately punctate, with two tubercles before middle and three behind, the median one much larger, lateral basal ones feeble ; apical sulcus obsolete, basal one broad, shallow. Elytra at base granulate-punctate, the punctures very shallow, punctation behind basal area rather coarse, dense, and rugose but more or less obscured by pubescence, extending to apex ; basal crest rather feebly elevated, with two or three small tubercles anteriorly ; apices broadly, separately rounded. Antennae with scape attaining apical fourth of pronotum, robust, subconical ; third segment about three-fourths again as long as first ; rest wanting.

Length 14 mm. ; width 4.6 mm.

Type locality : Angola.

DISTRIBUTION. Angola.

Angola : 1 ; Benguella [SM].

REMARKS. This species is distinguished from *M. nyassensis* by the elytra having the median oblique band fulvous, mottled with blackish, the eye somewhat smaller, subequal to gena in height, and the elytral disk rugosely punctate. Furthermore, the antennae are distinctly annulate with white at bases of segments at least from fourth.

***Neochamus pannulatus gilmouri* subsp. n.**

As in the nymotype but differing from it in having the pubescence of elytra fulvous instead of ashy, and at basal and apical third an irregular, whitish, oblique band outlining the usual median band. Scutellum dull fulvous, medially with a pale brownish macula. Antennae with scape fuscous pubescent, usually the third as well as following segments annulate with ashy.

Length 18–21 mm.; width 5–8.5 mm.

Holotype: ♂; TANGANYIKA: Lukuledi [ZSM].

Allotype: ♀; Kashitu [EFG].

Paratypes: 1; Kashitu [EFG]. 1; Lukuledi [ZSM]. 1; Tanganyika: Kilosa, Dec. 24, 1925 (N. C. E. Miller) BM 1927–503 [BM].

***Neochamus thoas* sp. n.**

MALE. Piceous, elytra dark reddish brown; densely fulvous pubescent, head more sparsely so. Scutellum nearly entirely yellowish white pubescent except at middle of base where it is slightly infuscated. Elytra basally with a broad, common, fuscous area extending to basal fourth at suture, rounding up to, but not covering, humerus; medially a rather narrow, fuscous, oblique fascia, which is irregular on its anterior and posterior margins, widest laterally, narrowing at suture just behind middle; at apical third toward suture an indistinct, fuscous, narrowly ovate, longitudinal macula. Body beneath and legs piceous, posterior abdominal sternites and tibiae dark reddish brown; covered with a sparse, fine, greyish fulvous pubescence, with scattered, sparse, white setae. Antennae piceous, segments from fourth dark reddish brown, fuscous pubescent, annulate with grey on basal halves of third and fourth segments, and on increasingly greater areas on remaining segments.

Head minutely alutaceous, with several coarse punctures behind eye and on vertex; front transverse, slightly narrowed above, with several widely scattered punctures; sides of genae coarsely punctate; eye with lower lobe erect, feebly taller than gena. Pronotum one-tenth wider across base than long; lateral tubercles median, prominent, armed with a short, acute spine; disk with five tubercles, the central one largest, about as broad as long, the apical pair more or less rounded, and the most lateral ones very small, rest of disk smooth except for several coarse punctures at apex and one or two basally. Elytra at base rather finely granulate-punctate in fuscous area, rest of disk with moderately dense, simple punctures which become finer apically; basal gibbosity rather feeble, but with a rounded crest on its summit, which in profile is not serrate; apices narrowly, separately rounded; humeri with a small tubercle at angle. Antennae more than twice as long as body,

very sparsely fimbriate on first three segments ; scape extending to apical third of pronotum, robust, subconical ; third segment robust, straight, nearly twice as long as first ; fourth robust, about one-half again as long as first ; fifth to seventh subequal, slightly longer than fourth ; rest gradually shorter, except eleventh, which is distinctly longer than the tenth.

Length 18 mm. ; width 6 mm.

Holotype : ♂ ; SOUTHERN RHODESIA : Mt. Selinda, 4,500 ft., December, 1929 (R. & L. Boulton) [CM].

REMARKS. While superficially very similar to *N. nyassensis*, this species is distinguished from that form by its scarcely punctate head and pronotum, the unserrated basal crest of the elytra, the nearly unicolorous scutellum, and the rounded discal tubercles of the elytra.

TRICHOLAMIA Bates

Tricholamia Bates, *Ent. mon. Mag.* **21**, 1884 : 14. Breuning, *Nov. Ent. suppl.* **3** (2), 1944 : 381.

Moechopsis Hintz, *Wiss. Ergebn. Deutsch. Zentr.-Afrika Exped.* **3**, 1911 : 438.

Large, elongate-oblong, robust. Head of normal length, vertex declivous, broadly, rather deeply sulcate, impunctate ; from one-fifth again as broad as high, laterally with a broad sulcus from middle of lower lobe of eye ascending onto side of antennal tubercle, sprinkled with short, erect hairs, medially with a narrow, deep sulcus ; eye with lower lobe strongly obliquely transverse, entire margin rounded, nearly twice as tall as gena, isthmus very broad, nearly as wide as upper lobes, which are as broad as the interocular space ; antennal tubercles robust, prominent, subapproximate basally, divergent apically. Pronotum one-fourth again as wide across base as long, sides parallel, uneven ; lateral tubercles slightly premedian, conical, with a short, acute tooth at apex ; apical and basal transverse sulci narrow, deep, the former recurved at middle ; disk with five large, prominent tubercles and with scattered, fine, setigerous punctures. Elytra with basal gibbosity subobsolete ; entire disk finely, sparsely punctate, each puncture bearing a long, erect, black hair ; apices broadly, separately rounded ; humeri simple, behind which the sides are coarsely granulate-punctate. Prosternal process simple, as is that also of mesosternum. Legs moderately long, hind ones longest ; femora not very robust, gradually narrowed to base and feebly so to apex ; protibiae unarmed in male ; protarsi dilated in male. Antennae defective, sixth segment attaining apical fifth of elytra, densely fimbriate beneath on all segments, entire scape and apices of other segments with long, dark setae ; scape attaining apical third of pronotum, robust, gradually clavate to apex, which is slightly flared laterally, cicatrix extending nearly two-thirds around apical margin, widest dorso-laterally ; third segment three-eighths again as long as first, straight, thickened apically ; fourth to sixth successively shorter ; rest wanting. Palpi with terminal segments broadly, squarely truncate in male.

Type species : *Tricholamia plagiata* Bates, by monotypy.

REMARKS. The long erect setae on the elytra and entire antennal scape (with shorter similar ones on pronotum and front), and the very broad isthmus of the eye will distinguish this genus.

Tricholamia plagiata Bates

Tricholamia plagiata Bates, *Ent. mon. Mag.* **21**, 1884: 15. Waterhouse, *Aid Ident. Ins.* **2**, 1886: pl. 170, f. 4. Breuning, *Nov. Ent. suppl.* **3** (2), 1944: 381. Lepesme, *Longicornia*, **1**, 1950: 561, fig. 8.

Moechopsis ruficornis Hintz, *Wiss. Ergebn. Deutsch. Zentr.-Afr. Exped.* **3**, 1911: 438, pl. 7, fig 13.

MALE. Fuscous, elytra, legs, and antennae dark reddish brown, densely covered with fulvous-ashy pubescence. Head above each side of middle near occiput clouded with brown. Scutellum somewhat brighter fulvous-ashy pubescent. Elytra with three large, fuscous markings, first a short broad fascia at extreme base, second a large, elongate, irregular plaga at middle towards sides, and third a rather large macula at apical quarter near middle of disk; entire disk irregularly sprinkled with a number of fuscous maculae. Body beneath, legs, and antennae broadly tinged with brown; tibiae apically and tarsi with bright ochraceous pubescence; antennal segments from third infuscated apically.

Head above with a rather deep, broad sulcus between eyes and antennal tubercles, impunctate; front one-fifth again as broad as high, the whole surface somewhat tumid, each side with an arcuate sulcus beginning at middle of lower ocular lobe and continuing on outer side of antennal tubercles, sprinkled irregularly with short, erect hairs; eye with lower lobe strongly obliquely transverse, nearly twice as tall as gena. Pronotum about one-fourth again as wide across base as long, sides parallel; lateral tubercles robust, conical, tapering into an acute tooth, slightly premedian; apical and basal transverse sulci very deeply impressed, narrow, the former distinctly recurved medially; disk covered with a number of rather long, erect hairs which arise from fine punctures, medially with five very prominent, irregular tubercles, the two lateral basal ones somewhat smaller. Elytra with basal gibbosity subobsolete, without a crest; entire disk finely sparsely punctate, each puncture bearing a long, black hair; apices broadly, separately rounded; behind humeri on sides a number of rather densely placed granulate-punctures. Antennae defective, sixth segment attaining apical fifth of elytra, densely fimbriate beneath with long hairs, the entire scape and the apex of remaining segments above with similar long hairs; scape attaining apical third of pronotum, robust, gradually thickened apically, slightly flared laterally at extreme apex; third three-eighths again as long as first, straight, slightly thickened at apex; fourth, fifth, and sixth successively, distinctly shorter, rest wanting.

Length 27 mm.; width 8.6 mm.

Type locality: Mt. Cameroons, Cameroons [*plagiata*]; N. Tanganyika [*ruficornis*].

DISTRIBUTION. West Africa.

Gold Coast: 1: no further data [BM].

REMARKS. The long hairs on the body above antennae, as well as the three large, dark plagiae on the elytra, will serve to distinguish this species.

The type locality of *ruficornis* is so widely separated from that of *plagiata* that the two may prove not to be identical when adequate material is at hand.

PAROCHAMUS gen. n.

Moderately large, cylindrical beetles. Head moderate in length; front not retracted, quadrate, sides parallel, scarcely narrowed between eyes, with a few coarse punctures; eyes with lower lobe ovate, one-third to one-half again as long as gena, erect, isthmus scarcely narrower than upper lobes, which are separated by nearly three times their width; antennal tubercles feebly prominent, narrowly separated and strongly divergent. Pronotum as wide across base as long in male, slightly transverse in female, scarcely narrower apically; lateral tubercles median, broad, prominent, armed with a long, acute spine; disk with five tubercles, lateral-most feeble; disk coarsely, sparsely punctate; apical sulcus subobsolete, basal one shallow and straight. Elytra with basal gibbosities rather prominent, not or feebly crested; disk roughly granulate-punctate on basal fifth, the punctures thence simple, confused to apex; apices broadly truncate; humeri with a tubercle at angle; sides gradually attenuate from humeri. Prosternal process about one-sixth as broad as procoxal cavity; mesosternal process simple, less than half as broad as a mesocoxal cavity, slightly tapering apically, apex feebly emarginate. Legs moderately long, forelegs longest in male; femora robust, cylindrical, metafemora attaining apex of fourth sternite; tibiae unarmed; protarsi strongly dilated in male. Antennae scarcely longer than body in female, more than twice body length in male, finely fimbriate beneath to third or fourth segment; scape robust, gradually clavate apically, moderately long, attaining apical third of pronotum, cicatrix confined to dorsal half of apical margin, broad, slightly broader laterally; third segment one and three-quarter times as long as scape, nearly straight, moderately robust; fourth and following very gradually decreasing in length in male, much more strongly shortened in female.

Type species: *Monohammus thomsoni* Chevrolat.

REMARKS. The antennal scape is somewhat similar in shape to that of *Neochamus* but it is considerably more elongate in male, attaining apical third of pronotum, and more slender, and the cicatrix is confined to the dorsal half of the surface. Moreover, the front is as high as wide, parallel-sided, and the elytra are roughly granulate-punctate at base.

KEY TO SPECIES

Elytra with a strong crest on basal gibbosity, the basal half of disk roughly rugosely punctate	<i>marshalli</i>
Elytra with at most a feeble crest, not rugosely coarsely punctate on entire basal half	<i>thomsoni</i>

***Parochamus thomsoni thomsoni* Chevrolat (comb. nov.)**

Monohammus Thomsoni Chevrolat, *Rev. Mag. Zool.* 7, 1855: 184; *Cent. Longic.*, 1858, No. 4; pl. 2, f. 4. Murray, *Ann. Mag. nat. Hist.* (4) 6, 1870: 478, pl. v, fig. 4.

MALE. Piceous to dark reddish brown, covered with brownish grey pubescence, occiput and basal and apical margins of pronotum slightly darker. Scutellum

stramineous, darker medially. Elytra ashy pubescent, at base a common, broad, velvety brown area, triangular in shape, extending along suture to basal quarter, prolonged briefly along anterior margin of humerus and below humeral angle; behind middle each elytron with a dark brown, velvety, comma-shaped macula, posteriorly attaining lateral margin but widely remote from suture, its posterior margin nearly straight; anterior lobe of this lateral spot surrounded by a broad, vague area of greyish brown; suture apically margined with greyish brown, and an indistinct macula of the same colour at apical quarter laterally. Body beneath and legs dark reddish brown, covered with brownish grey pubescence, with small, glabrous areas; legs greyish brown pubescent; tarsi ashy pubescent. Antennae with first two segments piceous, remainder reddish brown, paler apically, densely brownish grey pubescent.

Head minutely alutaceous, with a few coarse punctures on vertex and around eyes; front with a few coarse punctures, subquadrate, as wide as high; eye with lower lobe ovate, about one and a half times as tall as gena. Pronotum as wide across base as long; lateral tubercles broad, well elevated, armed with a long, acute spine; apical sulcus shallow, recurved medially, basal one shallow, straight; disk with five tubercles, the apical two broad, flat, the median one well elevated, elongate, the lateral basal ones small, with a few coarse punctures at apex and at base. Scutellum with sides strongly tapering, apex narrowly rounded. Elytra at base roughly, coarsely granulate-punctate, beyond basal quarter punctures simple, slightly finer apically; disk at base with a small gibbose area, with two or three tubercles in a line at centre of area, gibbosity accentuated behind by a rather deep, broad sulcus; apices obliquely truncate at suture. Antennae two or two and a half times as long as body, feebly fringed beneath on basal four or five segments; scape robust, gradually clavate, attaining anterior base of lateral pronotal tubercles, rugosely punctate; third segment nearly twice as long as first, straight; fourth three-quarters again as long as first, fifth and following very gradually shorter, except eleventh which is elongate and tapering.

FEMALE. As male, but antennae shorter, the ninth segment attaining elytral apex, the fourth and following segments much shorter; pronotal spines not so elongate; and elytra with basal gibbosity less pronounced.

Length 15-19 mm.; width 5.2-7 mm.

Type locality: Calabar.

DISTRIBUTION. West and Central Africa, except the Cameroons.

Nigeria: 1; Calabar [BM].

Gabon: 1; no further data [BM].

Belgian Congo: 1; Adouma [BM]. 1; Buta [SM].

Parochamus thomsoni buea subsp. n.

MALE. Closely resembles the nymotype but the lateral macula of the elytra is abbreviated anteriorly, the anterior lobe scarcely evident, so that the macula is oblique and not lunate in form.

Length 15–19 mm. ; width 5–7 mm.

Holotype : ♂ ; CAMEROONS : Buea [NRS].

Allotype : ♀ ; topotypic [NRS].

Paratypes : 3 ; topotypic [NRS]. 1 ; Buar [BM].

Parochamus marshalli Breuning (*comb. nov.*)

Monochamus marshalli Breuning, *Folia zool. Hydrobiol. Riga* 8, 1935 : 52 ; *Nov. Ent. suppl.* 3 (2), 1944 : 426.

FEMALE. Reddish brown, densely clothed with a burnished golden pubescence. Pronotum with the discal tubercles covered with pale yellowish white. Scutellum densely pale yellowish white pubescent. Elytra coppery brown pubescent, more concentrated to form a narrow vitta along suture before middle ; at extreme base with a brownish fascia which extends from humerus to humerus, behind this fascia a slightly wider, indistinct fascia of pale yellowish white ; behind middle with a large, velvety brown, comma-shaped macula, outlined with dense, yellowish white pubescence, more broadly and irregularly so posteriorly ; below humerus a smaller velvety macula. Antennae from third segment sparsely, finely, brownish grey pubescent.

Head coarsely, rather sparsely punctate ; front about as high as wide, scarcely narrowed between eyes ; eyes with lower lobe ovate, erect, one-third taller than gena. Pronotum one-third wider than long, slightly narrower apically ; apical sulcus subobsolete, recurved medially, basal one wide and shallow ; lateral tubercles median, prominent, ending in a short, robust spine ; disk with five small, rounded tubercles, the most lateral ones smallest, entire surface coarsely, sparsely punctate. Elytra with basal gibbosity crested, each crest having three or four round tubercles which are subcontiguous ; disk at extreme base to just behind crest nearly smooth, thence roughly rugosely punctate to about middle, behind middle somewhat less roughly so ; humeri with a few granules, a distinct tubercle at angle ; apices rather broadly truncate. Femora and entire undersurface with coarse, rather shallow punctures. Antennae slightly longer than body, moderately fimbriate beneath on first six segments, more sparsely so on seventh and eighth, and more densely fringed on all apices ; scape nearly attaining apical third of pronotum, robust, strongly clavate to apex where it suddenly expands, rugosely punctate ; third segment feebly sinuate, one-half again as long as first ; rest gradually diminishing in length.

Length 19 mm. ; width 6.5 mm.

Type locality : Belgian Congo.

DISTRIBUTION. South-eastern Belgian Congo.

Belgian Congo : 1 ; 18 m. SW. of Elizabethville, Feb. 11, 1928 (H. S. Evans) [BM—type].

REMARKS. This species differs from *thomsoni* in having the elytra strongly rugosely punctate and the basal fascia much narrower. Moreover, the basal crest is much more prominent, bearing three or four distinct tubercles.

CRIBROCHAMUS gen. n.

Rather small, elongate-oblong, cylindrical forms. Head short, vertex declivous, uniformly punctate over entire surface; front slightly wider than long, distinctly narrowed between eyes, more strongly so below; eye with lower lobe erect, ovate, a little longer than gena, upper lobes scarcely wider than isthmus, separated by four times one of their widths; antennal tubercles scarcely approximate at base, slightly prominent, strongly divergent apically; maxillary palpi with terminal segment about one-third again as long as last segment of labial palpi. Pronotum distinctly wider across base than long, sides gradually widened anteriorly, then constricted at extreme apex; lateral tubercles low, placed slightly post-medially, armed with a blunt tooth which is directed slightly backwards; apical and basal transverse sulci rather broad, indistinct; entire disk uniformly punctate, with five low tubercles, the anterior two more or less obliquely transverse. Elytra with basal gibbosity feeble, not crested; disk at extreme base densely granulate-punctate, at least rest of basal half cribrously punctate, thence punctures apically a little finer; sides tapering posteriorly; apices squarely truncate; humeri simple. Prosternal process simple, mesosternal process unarmed, distinctly convex. Legs moderate in length, hind pair slightly longer; femora cylindrical, feebly tapering at ends; protibiae unarmed in male. Antennae (male?) slender, sixth segment attaining elytral apex, fimbriate very slightly on scape; scape attaining apical third of pronotum, cylindrical, feebly widened towards apex, cicatrix reaching only one-half around apex, small; third segment straight, three-fourths again as long as first; fourth and following gradually shorter (wanting from eighth).

Type species: *Monohammus cribrus* Lameere.

REMARKS. This genus is distinguished especially by having the sides of the pronotum widened apically, the lateral tubercles placed slightly post-medially, the elytra are cribrously punctate on basal half, and the basal gibbosity is feeble, not crested. The entire head and pronotum, furthermore, are densely, uniformly punctate; the terminal segment of the maxillary palpi is much longer than that of the labial; and the antennal scape is slender, cylindrical, with the cicatrix extending only about one-half around the apical margin.

***Cribrochamus cribrus* Lameere (comb. nov.)**

Monohammus cribrus Lameere, *Ann. Soc. ent. Fr.* **62**, 1893: 45.

Monochamus cribrus Lameere. Breuning, *Nov. Ent. suppl.* **3** (2), 1944: 421.

Male? Dark reddish brown, elytra with paler areas; entirely covered with pale fulvous pubescence. Head and pronotum with glabrous punctures; front and genae partially glabrous; pronotal discal tubercles partially denuded. Scutellum densely yellowish white pubescent. Elytra with irregular, glabrous areas, the area along suture irregularly, sparsely pubescent. Body beneath dark reddish brown, abdomen paler from third sternite; moderately densely clothed with pale fulvous pubescence. Legs and antennae reddish brown, rather thinly clothed with fulvous pubescence.

Head rather densely covered with moderate-sized punctures, except genae below eyes, which are minutely, transversely rugose and with a few coarse punctures below eyes; front about one-fourth again as wide as high, narrowed between and below eyes; eye with lower lobe ovate, erect, one-fourth again as tall as gena; vertex declivous. Pronotum distinctly wider at base than long, apex as wide as base; lateral tubercles located feebly behind middle, slightly elevated, ending in a short, quite obtuse tooth; disk with five scarcely elevated tubercles, the two anterior ones slightly obliquely transverse, punctation as that of head. Elytra granulate-punctate at extreme base, thence rather coarsely cribrately punctate to behind middle, thence simply punctate to apex; apices tapering, squarely, feebly truncate; basal gibbosity obsolete. Antennae with seventh segment slightly surpassing apex of elytra, beneath feebly fimbriate; scape reaching to apical third of pronotum, cylindrical, barely widened towards apex; third segment straight, three-fourths again as long as first; fourth and following gradually shorter (defective beyond eighth segment).

Length 11 mm.; width 3.7 mm.

Type locality: Assinie [IVORY COAST].

DISTRIBUTION. West Africa.

Gold Coast: 1; Ashanti [BM].

MACROHAMMUS Aurivillius

Macrohammus Aurivillius, *Ent. Tidskr.* 7, 1886: 52. Breuning, *Nov. Ent. suppl.* 3 (2), 1944: 413.

Very large, robust, subcylindrical; head slightly elongate, vertex scarcely inclined; front nearly one-half again as wide at epistoma as high, distinctly narrowed between eyes, widened below, nearly impunctate; eye with lower lobe ovate, slightly taller than gena, isthmus subequal to upper lobes which are separated by twice their widths; antennal tubercles subcontiguous at base, divergent apically, prominent. Pronotum slightly wider basally than long, scarcely narrower apically; lateral tubercles median, rather broad, prominent, ending in a short, acute spine which is directed distinctly upward; apical and basal sulci distinct; disk with five tubercles, lateral basal ones more distinct, nearly impunctate. Scutellum narrowly triangular; truncate at apex. Elytra with basal gibbosity slightly prominent, not crested; disk with punctation largely concealed by pubescence; apices broadly rounded or subtruncate; humeri simply rounded. Pro- and mesosternal processes simple. Legs moderate in length, hind pair feebly longer; protibiae unarmed; protarsi distinctly expanded in male. Antennae about two and one-half times body length in male, sparsely fimbriate beneath only on scape; scape attaining apical quarter of pronotum, robust, distinctly clavate apically, cicatrix extending about two-fifths around apical margin, confined to lateral portion, distinctly rimmed, rather broad; third segment robust, thicker basally, nearly straight, almost twice length of scape; fourth and fifth successively longer than third; sixth and seventh subequal to fifth; remaining gradually shorter (eleventh wanting).

Type species: *Monochamus deyrollei* Thomson, by monotypy.

REMARKS. This genus is distinguished by the large size of its members, by the

fourth and fifth antennal segments being longer than the third, by the form of the cicatrix, and by the nearly impunctate elytra.

***Macrohammus deyrollei* Thomson**

Monochamus deyrollei Thomson, *Ann. Soc. ent. Fr.* (5) 9, 1879: xxvi.

Macrohammus Deyrollei Thomson. Aurivillius, *Ent. Tidskr.* 7, 1886: 53, fig. 1. Breuning, *Nov. Ent. suppl.* 3 (2), 1944: 414.

MALE. Black, rather densely covered with greyish fulvous pubescence. Head above and frontal disk tinged with brownish. Elytra each with four to five irregular, partially confluent, velvety brown maculae, the ones at base and apex largest, the former confluent at suture. Legs black, covered with fine, yellowish grey pubescence. Antennae with scape piceous, rest reddish brown, entirely and very thinly covered with yellowish grey pubescence.

Head minutely punctulate and with sparse, shallow punctures; front one-half again as wide at epistoma as high, strongly narrowed between eyes, widened below, medially deeply, broadly sulcate to middle of length; eyes with lower lobe ovate, slightly taller than gena. Pronotum slightly wider across base than long, feebly narrowed apically; lateral tubercles broad, median, ending in a short, acute spine which is directed slightly upward; apical and basal transverse sulci distinct, the former feebly arcuate, the latter trisinate; disk with five tubercles, the lateral basal ones more prominent than the others, finely, densely punctulate, with sparse, fine punctures interspersed. Elytra with basal gibbosity slightly prominent; disk entirely, finely, densely punctulate, with scattered, fine punctures largely concealed by the pubescence; apices separately, broadly rounded. Antennae about two and one-half times as long as body, with a slight fringe beneath on scape; scape attaining apical fourth of pronotum, robust, distinctly clavate apically, finely punctulate; third segment robust, nearly straight, thicker basally, almost twice as long as first; fourth one-tenth longer than third, and fifth longer than fourth; sixth and seventh subequal to fifth; rest gradually shorter; eleventh wanting.

Length 42-44 mm.; width 16-17 mm.

Type locality: Gabon.

DISTRIBUTION. West Central Africa.

Cameroons: 1; no further data [NRS]. 1; Buea [NRS].

REMARKS. Distinguished by its large size from all other known African Monochamines. The elytral maculation, along with its nearly impunctate disk, will serve further to identify it.

***INSULOCHAMUS* gen. n.**

Large to very large, cylindrical. Head rather elongate; front not retracted, subquadrate or feebly transverse, distinctly narrowed between eyes, rugose or moderately punctate; eye with lower lobe oblong or broadly ovate, one and one-half to two times as tall as gena, isthmus about half as wide as an upper lobe, upper lobes separated by about one of their widths or slightly more; antennal tubercles approximate at base, rather prominent, divergent apically. Pronotum slightly

wider at base than long, visibly narrowed apically ; lateral tubercles medial, rather broad, prominent, armed with a rather long, blunt spine ; disk with from three to five tubercles which are sometimes quite feeble, and with a broad median impression, entirely coarsely punctate, medially sometimes rugosely so ; apical sulcus shallow, recurved medially, basal sulcus deeper, straight. Elytra granulate-punctate on basal fifth or more, remainder of disk rather coarsely, moderately, confusedly punctate, the punctures slightly finer apically ; basal gibbosity prominent, outlined behind by a deep arcuate sulcus, without a crest ; apices separately rounded or obliquely truncate ; humeri simple. Prosternal process simple, not narrow, nearly one-third as wide as a procoxal cavity ; mesosternal process tapering posteriorly, nearly half as wide as a mesocoxal cavity, feebly emarginate at apex. Legs elongate, front ones longest in male ; metafemora attaining or surpassing the apex of the fourth sternite ; protibiae in male longer than femur and dentate or spined at apical third, rest equal to femora, as are all tibiae in female ; protarsi dilated in male. Antennae nearly twice as long as body in male, one-third longer in female, distinctly fimbriate beneath nearly to apex ; scape robust, cylindrical, sides nearly parallel, suddenly expanding at apex, extending to apical fourth of pronotum, cicatrix extending nearly two-thirds around apical margin, subequal in width throughout, except for a slight widening externally ; third segment straight, not swollen, from two-thirds to once again as long as first ; fourth robust, slightly shorter than third ; remainder gradually shorter, except eleventh in male, which is elongate.

Type species : *Monochamus thomensis* Jordan.

REMARKS. Very closely related to *Laërtochamus* but the front and pronotal disk are rugosely sculptured ; the pronotal lateral tubercles have a long tooth at apex ; elytra are usually coarsely granulate-punctate at base and coarsely simply punctate over rest of surface ; and antennal scape is more elongate. Both genera are somewhat related to *Leprodera* but differ in the form of the scape and in the pronotal spine being at the middle.

KEY TO SPECIES

- | | | |
|----|--|---------------------|
| 1. | Pronotum each side with a broad fulvous vitta above lateral tubercles . | <i>fulvisparsus</i> |
| | Pronotum with a short glabrous vitta above each lateral tubercle | 2 |
| 2. | Elytra with granulation moderate in size, along middle of disk extending to centre of elytron ; Annobon Island | <i>annobonae</i> |
| | Elytra with granulation coarse, at middle of disk terminating at basal fifth ; St. Thomas Island | <i>thomensis</i> |

Insulochamus thomensis Jordan (*comb. nov.*)

Monochamus thomensis Jordan, *Novit. zool.* 10, 1902 : 193. Breuning, *Nov. Ent. suppl.* 3 (2), 1944 : 418.

MALE. Piceous, elytra sometimes slightly paler. Head and pronotum rather sparsely covered with brownish tawny pubescence ; the former touched with ochraceous behind eyes above and below ; the latter with a narrow, indistinct vitta medially of the same colour, and with a short glabrous vitta above each lateral

tubercle. Scutellum dull ochraceous. Elytra sparsely, finely, dark brown pubescent, giving the appearance of being nearly glabrous, and with more or less reticular patches of dull fulvous, forming very irregular fasciae before and behind the middle ; at base irregularly ochraceous pubescent. Body beneath very sparsely brownish fulvous pubescent ; broadly ochraceous on mesosternum, on mesosternal side-pieces and first several sternites of abdomen. Legs piceous, tibiae and tarsi slightly paler ; very finely, sparsely fulvous-grey pubescent. Antennae piceous, becoming dark reddish brown from third segment ; scape sparsely brownish grey pubescent, from third pubescence denser and fulvous-brown.

Head above minutely alutaceous and with coarse, scattered punctures ; genae behind eye with coarse punctures ; front feebly transverse, slightly constricted between eyes, coarsely, sparsely punctate ; eye with lower lobe feebly transverse, about one-half again as tall as gena. Pronotum narrowed apically, slightly wider at base than long ; lateral tubercles medial, broad, ending in a short, obtuse spine ; apical and basal sulci rather deep, the former recurved medially ; disk with three tubercles, the median one elongate, somewhat rugose, moderately densely punctate. Elytra near extreme base granulate, granules moderate in size, not densely placed, thence granulate-punctate to basal fifth, punctures simple and finer to apex ; apices subtruncate. Antennae twice as long as body, sparsely fimbriate on basal first three segments and on ninth and basal half of eleventh, much more densely so on remaining segments except tenth and apical half of eleventh, which are devoid of fringe ; scape roughly rugose, feebly clavate apically, attaining apical third of pronotum ; third segment straight or nearly so, not quite twice as long as scape ; fourth nearly one-half again as long as first ; rest gradually shorter, except eleventh which is longer than third, arcuate.

FEMALE. More robust ; nearly uniformly, densely, fulvous-ochraceous pubescent, on elytra clouded irregularly with dark brown ; body beneath more densely pubescent than in male, as are the legs ; antennae more or less annulate on basal half of third and following segments. Antennae one-third longer than body, third segment three-fifths again as long as first, rest successively shorter, except eleventh which is slightly longer than tenth.

Length 14-30.8 mm. ; width 4.5-11 mm.

Type locality : St. Thomas Island.

DISTRIBUTION. St. Thomas and Prince's Islands.

St. Thomas Island : 2 ; no further data [EFG]. 2 ; Agua-Ize, Dec., 1900 (L. Fea) [NRS]. 1 ; Vista Alegre, Sept.-Oct., 1900 (L. Fea) [NRS].

Prince's Island : 1 ; no further data [EFG].

REMARKS. This species is remarkable for the sexual differences in coloration.

Insulochamus annobonae Aurivillius (*comb. nov.*)

Monochamus annobonae Aurivillius, *Ann. Mus. Stor. nat. Genova*, **52**, 1928 : 478. Breuning, *Nov. Ent. suppl.* **3** (2), 1944 : 419.

MALE. Fuscous, rather densely covered with dingy ashy pubescence. Head with four small, triangular, glabrous maculae on occiput. Pronotum with pub-

escence tinged with fuscous at middle and below lateral tubercles, with three short, glabrous vittae, the median one very fine, the others broader, placed above the lateral tubercles, and with two small, rounded, glabrous maculae, one each side just before middle. Scutellum with pubescence irregularly denser in places, especially in a broad area at base and a narrow one behind middle and on apical third. Body beneath, legs, and antennae fuscous, rather sparsely and uniformly covered with fine, silky, brown-grey pubescence, the tarsi ashy pubescent; antennae with apical segments a little paler.

Head above minutely alutaceous, medially with a broad patch of rather coarse punctures, genae behind eyes coarsely punctate; front feebly transverse, slightly narrowed between eyes, uniformly sparsely, coarsely punctate; eye with lower lobe two-thirds again the length of gena, slightly transverse. Pronotum tapering apically, distinctly wider across base than long; lateral tubercles placed at middle, broad, moderately elevated, ending in a short, subacute spine; apical and basal transverse sulci entire, rather deep, both recurved medially, apical one more strongly so; disk with five feeble tubercles, the two lateral ones subobsolete, the median one most prominent and largest, with scattered, rather fine punctures, especially towards sides. Elytra at extreme base with rather dense, fine granules which become granulate-punctures and then quite dense, coarser, simple punctures, diminishing suddenly in size behind apical third, the granulations continuing almost to middle; apices separately, broadly rounded. Antennae twice body length, fifth segment attaining elytral apex, very sparsely fimbriate beneath on basal six segments, then much more densely so to apex; scape feebly, gradually clavate apically, attaining apical third of pronotum, roughly, rugosely punctate and minutely, densely punctulate; third segment two-thirds again as long as first, nearly straight; fourth two-fifths again as long as scape; remaining gradually shorter, except eleventh which is as long as third.

Length 26 mm.; width 8 mm.

Type locality: Annobon Island.

DISTRIBUTION. Annobon Island.

Annobon Island; 1; May, 1902 (L. Fea) [NRS—type].

REMARKS. The male of this species resembles somewhat the female of *thomensis* but is dull ashy pubescent, not fulvous, and the punctation of the elytra is denser, much finer, and more strongly granulose, the granules attaining the middle. The fimbriation of the antennae is also unique.

Insulochamus fulvisparsus Gahan (*comb. nov.*)

Monohammus fulvisparsus Gahan, *Ann. Mag. nat. Hist.* (6) 2, 1888: 395.

Monochamus fulvisparsus Gahan. Breuning, *Nov. Ent. suppl.* 3 (2), 1944: 419.

MALE. Piceous; head and pronotum sparsely covered with fine, fulvous pubescence, which is condensed to form a margin around eyes, and on the pronotum to form a fine vitta medially and a broad one each side, not attaining apex. Scutellum densely, fulvous pubescent, much more sparsely so medially. Elytra very sparsely, finely, dark brown pubescent, and with minute reticulating patches of fulvous

pubescence, these patches are quite sparse in places, leaving a dark band behind middle. Body beneath grey-fulvous pubescent; prosternum with a densely pubescent vitta antero-laterad of each coxa. Legs and antennae piceous, the latter slightly paler from third segment, sparsely covered with brownish tawny pubescence; legs sparsely grey-tawny, the tarsi entirely grey pubescent.

Head minutely alutaceous, with a few punctate rugae above; genae behind eyes coarsely punctate; front subquadrate, sides nearly parallel, densely, nearly scabroscely punctate; eye with lower lobe quadrate, with angles rounded, one-half again as tall as gena. Pronotum distinctly wider at base than long, visibly narrower apically; lateral tubercles broad, moderately elevated, with a long, obtuse spine at apex; apical and basal sulci shallow, the former broad, recurved medially, with a second entire sulcus near each margin; disk with three feeble, broad tumosities, the median one placed more basad, basal half and bases of lateral tubercles with moderately coarse punctures, a few transverse rugosities on median tumescence and cephalad of it. Scutellum strongly depressed medially. Elytra basally with moderately dense, large granules, thence becoming first granulate-punctures, then coarse punctures which diminish in size apically; humeri rounded; apices feebly obliquely truncate. Antennae imperfect, lacking segments beyond fourth, fimbriate through fourth; scape gradually clavate, reaching to apical two-fifths of pronotum, roughly rugosely punctate; third segment straight, finely, densely punctate, feebly rugose on basal half, not tumid, twice as long as scape.

Length 28 mm.: width 9 mm.

Type locality: Congo.

DISTRIBUTION. Belgian Congo.

Belgian Congo: 1; no further data [BM—type].

REMARKS. The fulvous vittae on the pronotum and the minute, fulvous, réticular maculae on the elytra, plus the presence of two grey fulvous vittae on the prosternum, will amply distinguish this form.

QUASIOCHAMUS gen. n.

Moderate-sized, cylindrical beetles, with head slightly elongate; front not retracted, feebly transverse, slightly narrowed between eyes; impunctate or with a few coarse punctures; eyes with lower lobe ranging from one and one-third to nearly two times as tall as gena, oblong or obliquely ovate, isthmus at least half as wide as upper lobe, upper lobes separated by at least once their width; antennal tubercles subapproximate at base, strongly divergent, prominent. Pronotum quadrate or scarcely elongate, base and apex subequal; lateral tubercles median, broad, with a short, obtuse tooth at apex; disk with three feebly elevated tubercles; apical and basal sulci very shallow, former recurved medially, not forming a deep impression at middle, surface very sparsely punctate, especially basally. Elytra subcristate on base, with one or more granules on the elevation; sparsely, finely granulate on basal fifth, remainder of surface simply, subseriately punctate; humeri with a small tubercle at angle; apices obliquely, rather narrowly truncate; sides rather strongly attenuate from behind middle in male, slightly less strongly so in

female. Prosternal process simple, between one-fifth and one-third as broad as a procoxal cavity; mesosternal process around one-fourth as broad as a mesocoxal cavity, feebly tapering to, and subtruncate at, apex. Front legs longest in male; femora rather slender, cylindrical, narrowed basally; metafemora nearly attaining apex of fourth sternite; tibiae as long or feebly longer than femora; protarsi feebly dilated and fringed in male. Antennae in male twice length of body, in female one-fourth again as long as body, slightly fimbriate to fourth or fifth segment; scape short, extending scarcely beyond apex of pronotum, robust, gradually thickened from base to apex, cicatrix extending more than two-third around apical margin, moderately wide, slightly wider laterally; third segment feebly robust, nearly straight or strongly bisinuous, from one and three-quarters to more than twice length of scape; fourth feebly shorter than third; fifth and following segments either subequal or feebly diminishing in length.

Type species: *Monochamus nigrofasciatus* Aurivillius.

REMARKS. Most closely related to *Neochamus*, this genus is distinguished in having the head much longer and the pronotum less strongly transverse, with the disk bearing only three tubercles and being very sparsely punctate. Moreover, the antennae have the third segment more elongate and the lower lobe of the eye is taller.

KEY TO SPECIES

1. Elytra at base with a large, common, fuscous area *adamitus*
 Elytra without a common, fuscous area at base 2
2. Elytra with a moderately wide, pale fascia just behind middle, rest of apex dark
 pubescent *balteatus*
 Elytra with entire apical third pale pubescent *nigrofasciatus*

Quasiochamus nigrofasciatus Aurivillius (comb. nov.)

Monochamus nigrofasciatus Aurivillius, *Ark. Zool.* 8 (29), 1914: 14.

Monochamus nigrofasciatus Aurivillius. Breuning, *Nov. Ent. suppl.* 3 (2), 1944: 423.

MALE. Head and pronotum piceous, rather densely, greyish brown pubescent; eye outlined with fulvous. Pronotum usually with three denuded, black maculae on disk. Scutellum fulvous pubescent, pubescence much sparser medially. Elytra reddish brown, brownish fulvous pubescent; at middle each with a broad, oblique, dark brown fascia, joining at suture, its margins very irregular, forming small maculae and with several brownish fulvous maculae along its borders also; on apical fourth several small, irregular, dark brown maculae along suture and lateral margins. Body beneath dark reddish brown, apical margins of sternites paler, densely covered with brownish fulvous pubescence. Legs and antennae reddish brown, the former densely covered with greyish brown pubescence; tarsi somewhat cinereous pubescent; antennae with bases of segments cinereous and brown variegated, apices darker brown pubescent.

Head minutely alutaceous, sometimes with a few coarse, deep punctures; front subquadrate, sides subparallel; eyes with lower lobes quadrate, one-half again as tall as gena. Pronotum quadrate; lateral tubercles placed at middle, broad,

ending in a short, obtuse spine ; basal and apical sulci shallow, the latter recurved medially ; disk with three feebly elevated, rounded tubercles, the median one placed posteriorly, more elongate, entire surface and bases of lateral tubercles with a few coarse, scattered punctures. Elytra at extreme base midway between scutellum and humeri with an elevated cluster of several granules ; basal gibbosity feeble, with a row of coarse granules medially ; disk with basal fifth moderately granulate-punctate, thence with rather coarse, dense punctures which become finer apically ; humeri with a small, rounded tubercle at apex ; apex rather narrowly, obliquely truncate. Antennae (wanting beyond seventh segment) with the sixth segment attaining elytral apex, first four segments rather densely fimbriate ; scape robust, only feebly widening to apex, minutely, densely punctate, just surpassing apex of pronotum ; third segment robust, arcuate, more than twice, and fourth slightly less than twice, as long as first ; fifth to seventh segments subequal, feebly shorter than fourth.

Length 14–20 mm. ; width 4.5–5.2 mm.

Type locality : Uganda : Entebbe.

DISTRIBUTION. Eastern Belgian Congo and Uganda.

Belgian Congo : 1 ; Ibembu, Upper Itemtiri, Aug. 1–15, 1890 (Duvivier) [NRS].

1 ; Arn [SM]. 1 ; Ukaika, Dec., 1910 (Grauer) [VM]. 1 ; Niapu, 26° 48' E., 2° 15' N., Jan., 1914 [AMNH].

REMARKS. This species, besides its distinctive maculation, is distinguished by the three flat tubercles of the pronotal disk, by the granules being in a crest-like cluster at middle of extreme base of elytra, by the elytral apices being narrowly truncate, and by the antennal formula.

Quasiochamus balteatus Aurivillius (*comb. nov.*)

Monochamus balteatus Aurivillius, *Ent. Tidskr.* **24**, 1903 : 268. Breuning, *Nov. Ent. suppl.* **3** (2), 1944 : 423.

MALE. Head and pronotum black, elytra dark reddish brown, entirely covered with dense, dark brown pubescence. Head above often with an indistinct fuscous macula behind each eye ; front laterally indistinctly margined with golden brown pubescence. Pronotum on sides and irregularly on disk with golden brown pubescence ; disk with three rather large, denuded maculae arranged in the form of an inverted triangle, the median one often elongated. Scutellum narrowly margined with fulvous. Elytra irregularly varied with golden brown or fulvous pubescence ; at apical third each with a large, transverse, irregular, dingy whitish macula which is somewhat interrupted by dark brown, rounded maculae. Body beneath and legs densely covered with orange-brown pubescence. Antennae dark reddish brown, gradually paler apically, sparsely greyish brown pubescent, the pubescence somewhat darker on apices of segments.

Head entirely impunctate or with a very few fine punctures above and on front ; front about one-fifth wider than long, gradually narrowed between eyes ; eye with lower lobe oblong, nearly twice genal height. Pronotum slightly longer than wide across base ; apical and basal sulci obsolete ; lateral tubercles rather small but

prominent, ending in a robust, obtuse tooth ; disk nearly impunctate, with a few coarse punctures apically and on sides, with three low tubercles, the posterior median one much larger than the others. Elytra with basal gibbosity feeble, at anterior margin of each a single, rather large tubercle ; disk on basal sixth rather sparsely, finely granulate-punctate, punctures thence rather coarse, more or less subseriate, becoming finer to apex ; apices rather broadly, obliquely truncate to suture ; humeri at angle with a rather distinct tubercle. Antennae over twice body length, with a long fringe beneath to middle of sixth segment ; scape robust, strongly narrowed at base, reaching very slightly beyond pronotal apex ; third segment bisinuate, not quite twice length of first ; fourth and following segments gradually decreasing in length, eleventh missing.

FEMALE. As in male but antennae only one-fourth again as long as body, fimbriate to seventh or eighth segment, third segment only half again as long as first, arcuate. Length 16–18 mm. ; width 5.5–6 mm.

Type locality : Cameroons.

DISTRIBUTION. The Cameroons.

Cameroons : 1 ; no further data [NRS—type]. 1 ; North Cameroon (L. Conradt) [DEI].

REMARKS. This species is distinguished by the three denuded maculae on the pronotum and by the transverse whitish maculae at apical third of the elytra.

***Quasiochamus adamitus adamitus* Thomson (*comb. nov.*)**

Monochamus adamitus Thomson, *Arch. Ent.* 1, 1857 : 293. Breuning, *Nov. Ent. suppl.* 3 (2). 1944 : 425.

MALE. Head piceous, pronotum and elytra dark reddish brown. Head and pronotum rather densely greyish brown pubescent, the former with eye margined narrowly with deep fulvous, frontal sutures narrowly vittate with the same colour ; front with three glabrous maculae arranged in the form of a triangle. Scutellum fuscous, broadly margined with dull ochraceous. Elytra rather densely covered with dull grey and brown variegated pubescence ; base with a common, fuscous, triangular macula, its apex attaining basal quarter of suture ; humeri anteriorly margined with dull ochraceous, beneath with a small fuscous macula ; disk with an oblique band of dull brown at middle, widest laterally, tapering to suture, on apical quarter dull brown pubescent, this area sometimes joined by the median fascia ; entire surface including fasciae sprinkled with more or less rounded, fuscous maculae. Body beneath and legs rather densely covered with golden brown pubescence. Antennae dark reddish brown, apical segments slightly paler, rather sparsely clothed with golden brown pubescence.

Head above minutely alutaceous, with a few coarse punctures along median line ; front one-fifth wider than long, feebly narrowed between eyes, with a few coarse punctures ; eye with lower lobe obliquely ovate, nearly twice as tall as gena. Pronotum about as wide at base as long ; lateral tubercles medial, moderately elevated, ending in an obtuse tooth ; apical and basal sulci broad, shallow, apical one recurved medially ; disk with three tubercles, median one broad, elongate, the

two anterior ones small, rounded, with scattered, coarse punctures on entire surface including lateral tubercles. Elytra each with a feeble gibbosity at base, on apex of which is a row of not prominent granules, basal fifth of disk with smaller granules, rest of surface coarsely punctate, punctures becoming somewhat finer apically; humeri with a small, rounded tubercle at angle; apices obliquely truncate. Antennae two and a fourth times as long as body, feebly fimbriate beneath on the first three segments, somewhat more densely so at apex of third; scape robust, gradually clavate to apex, finely and densely punctulate, attaining apical fifth or sixth of pronotum; third segment twice as long as first, straight, not tumid; fourth one-sixth shorter than third; rest gradually shorter, except seventh and eleventh, each of which is nearly equal to fourth in length.

Length 12-15.3 mm.; width 4-5 mm.

Type locality: "Singapore" [in error].

DISTRIBUTION. Sierra Leone.

Sierra Leone: 2; no further data [BM].

No locality data: 1; Sharp collection [BM].

REMARKS. While superficially resembling *M. nyassensis*, this species is not closely related to that one. The head here is impunctate behind eyes; the eye is much larger; the pronotum is nearly quite as long as wide at base and has but three discal tubercles; and the elytra have a few scattered, round, fuscous maculae instead of the irregular-shaped mottling of the South African species.

***Quasiochamus adamitus balfour-brownei* subsp. n.**

MALE. As in nymotype but pubescence of upper surface cinereous; legs more grey-brown pubescent; antennae distinctly cinereous, annulated on basal two-thirds of segments beginning with the third; elytra with a few more fuscous maculae.

Length 15.5 mm.; width 5.2 mm.

Holotype: ♂; SENEGAL: (ex Mus. Laferté) BM. 1905-100, Bocandé [BM].

REMARKS. This fine form is dedicated to Mr. Balfour-Browne who co-operated with the authors very generously throughout the preparation of this paper.

***Quasiochamus adamitus patriciae* subsp. n.**

MALE. As in the nymotype, but the general body pubescence is a deeper brown. Elytra with median fascia indistinct, only feebly darker than that of rest of surface, the brownish apical area indistinct, nearly lacking, basal band extending beyond basal quarter of suture. Scutellum entirely pale pubescent except for a small dark macula at extreme base. Head lacking coarse punctures on vertex and on front.

Length 16.5 mm.; width 5 mm.

Holotype: ♂; GOLD COAST, July 24, 1945 (G. H. Thompson) BM. 1948-165 [BM].

REMARKS. This species is named for our daughter in recognition of her services in our entomological endeavours.



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MISS L. E. CHEESMAN'S EXPEDITIONS
TO NEW GUINEA

TRICHOPTERA



D. E. KIMMINS

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ENTOMOLOGY

Vol. 11 No. 4

LONDON: 1962

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BY

D. E. KIMMINS

British Museum (Natural History)

Pp. 97-187 ; 74 Text-figures

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MISS L. E. CHEESMAN'S EXPEDITIONS TO NEW GUINEA

TRICHOPTERA

By D. E. KIMMINS

SYNOPSIS

This paper is based upon material collected by Miss L. E. Cheesman, 1933-34, 1936 and 1938. Fifty-one new species are described, in nine families, and keys are given to the Papuan species of the genera *Chimarra*, *Polycentropus*, *Oecetis* and *Triaenodes*.

THE greater part of the material upon which this paper is based was collected by Miss L. E. Cheesman on her expeditions to New Guinea in 1933-34, 1936 and 1938, to which has been added such other unidentified material in the British Museum from New Guinea. Some explanation is due for the long delay in working out these collections, which were received by the British Museum before the war by my late colleague Mr. M. E. Mosely. He was proposing to work on them but on hearing from Dr. G. Ulmer of his work on a large collection of Trichoptera from the Lesser Sunda Islands, Mosely decided to put the Papuan material on one side until the completion of Dr. Ulmer's work. The war delayed the publication of Ulmer's papers and Mosely died before they were completed.

Miss Cheesman was not in any way specialising in the collection of Trichoptera, but in spite of this, she has succeeded in bringing the total of species for New Guinea up to eighty-six, of which some fifty are here described as new to science. This number is probably only a fraction of the total fauna, since comparatively little work has been done on the Trichoptera of this area, and consequently it is not surprising that many species *appear* to be endemic. In our present state of knowledge, one cannot say much about the origin of the Papuan Trichopterous fauna, other than that there are affinities with the faunas of Australia, Solomon Islands, Fiji, Borneo and the Sunda Islands.

The author would like to express to Miss Cheesman his thanks for the opportunity to work on this material. The types of all new species are deposited in the British Museum (Natural History) and all material was collected by Miss Cheesman unless otherwise stated. Names of species not collected by Miss Cheesman are enclosed within square brackets.

Family RHYACOPHILIDAE

Subfamily HYDROBIOSINAE

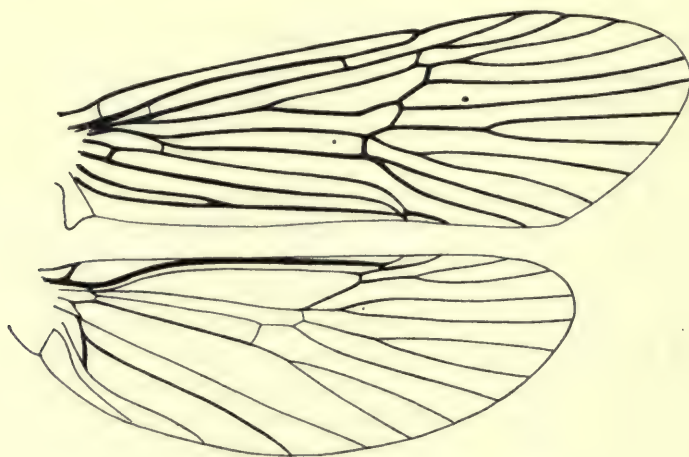
Percivalia papuana sp. n.

(Text-figs. 1-2)

PAPUA: Mt. Tafa, 8,500 ft., iii. 1936, 1 ♂, 2 ♀.

♂. General colour fulvous, with sparse fuscous hairs on head and thorax. Eyes black. Wings of holotype rather denuded. In the fore wing, cell R_2 has a short footstalk, cell R_4 sessile. Discoidal cell closed. In the hind wing cells R_2 , R_4 , M_1 , and Cu_{1a} all with footstalks.

♀. Wings pale fuscous, with upstanding fuscous and golden hairs on the veins of the fore wing. The marginal fringe of the latter is fuscous, with golden spots on the apices of the veins. Venation much as in male.

FIG. 1. *Percivalia papuana* sp. n. ♂ Wings.

♂ GENITALIA. Fifth segment with short lateral filaments. There is a long, slender ventral process on the sixth segment but the seventh is practically unarmed. The ventral process of the sixth segment terminates in a few small, black, peg-like teeth. Ninth segment short, its ventral margin excised at its centre. The tenth segment is fused to the ninth, extending as a moderately elongate, narrow tube. Cercus small and rounded. Paracercus short and bifid. Filicercus long and slender, slightly clavate at its apex. Aedeagus short, cylindrical, its base encircled by a sclerotized sleeve, whose lower apical margin projects downwards on each side of the aedeagus in a flattened claw. Clasper about as long as tenth segment, narrowed a little at its base, in side view with its lower margin dilated before the apex, which is excised in ventral view.

♀ GENITALIA. A long, slender ventral process, terminating in black, peg-like teeth, on the fifth abdominal segment and a short, pointed process on the sixth. Seventh sternite with its apical margin in side view produced in a rounded lobe. Eighth segment partially divided into tergite and sternite, the tergite overlapping the sternite. Ninth tergite with its lower apical

angles produced in rounded lobes, its sternite more or less fused to apex of eighth. Tenth segment represented by a pair of small, rounded plates, each carrying a two-segmented cercus, terminal segment minute. In the allotype there is a pair of membranous fingers below the

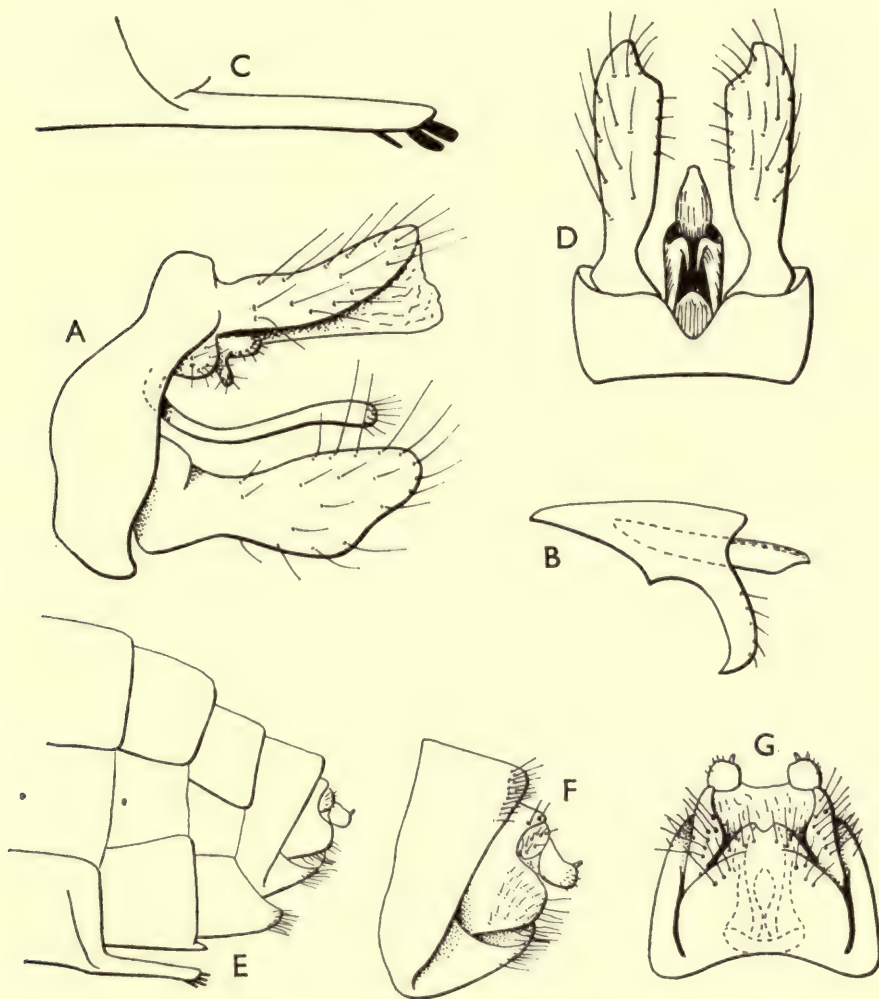


FIG. 2. *Percivalia papuana* sp. n. Genitalia. A, ♂, lateral; B, ♂, aedeagus, lateral; C, ♂, ventral process of sixth abdominal segment, lateral; D, ♂, ninth segment, claspers and aedeagus, ventral; E, ♀, fifth to tenth abdominal segments, lateral; F, ♀, eighth to tenth segments, lateral; G, ♀, eighth to tenth segments, ventral.

cerci, possibly accidentally extruded, which are not figured. Internal structure indistinct, semi-membranous, its shape indicated in the ventral view.

Length of fore wing, ♂, 10 mm., ♀, 11 mm.

♂ HOLOTYPE pinned, abdomen in glycerine, one pair of wings mounted dry, ♀ allotype pinned, abdomen in glycerine, and ♀ paratype. I was at first inclined

to place this species in *Taschorema*, which it resembles in the form of the male genitalia, but the absence in the male of a scale-patch in the cubito-anal area of the hind wing, the presence of a footstalk to cell R_4 in the same wing and the absence of a ventral process to the seventh abdominal segment all suggest *Percivalia*. It differs from other species of *Percivalia* (= *Notiobiosis* Mosely partim) in the presence of short lateral filaments to the fifth segment. I am unable to say whether there are any eversible scent-organs between the second and third abdominal segments, as this area was damaged in the holotype.

Family GLOSSOSOMATIDAE

Subfamily GLOSSOSOMATINAE

Synagapetus ulmeri Ross

PAPUA : Kokoda, 1,200 ft., vii-ix. 1933, 38 ♂.

Previously recorded from New Guinea.

Synagapetus sp.

PAPUA : Kokoda, 1,200 ft., vii-ix. 1933, 86 ♀.

It is probable that the majority of these females are *S. ulmeri* Ross, but as there are two males of another species from the same locality, it seems unwise to determine them specifically.

Synagapetus jafiwi Ross

DUTCH NEW GUINEA : Cyclops Mts., Sabron, Camp 2, 2,000 ft., vii. 1936, 8 ♂, 12 ♀; Mt. Cyclops, 3,500 ft., iii. 1936, 1 ♂.

Previously recorded from New Guinea.

Synagapetus productus sp. n.

(Text-fig. 3)

PAPUA : Kokoda, 1,200 ft., ix. 1933, 2 ♂.

General colour dark fulvous, head and thorax with pale golden hairs. Antenna stout, ochraceous at its base, becoming fuscous towards the apex. Eyes black. Palpi fuscous. Legs fulvous, with fuscous spurs. Wings pale fuscous, anterior with a darker fuscous patch at the base of the stigma, pubescence fuscous.

♂ GENITALIA. In general pattern resembling *S. jafiwi* Ross. There is a strong, slender process to the sixth sternite. Tenth segment long, extending beyond the apex of the clasper. It consists of a pair of thin, convex plates with membrane between them, in side view tapering to an obliquely truncate apex, which carries an acute, outwardly and basally directed tooth. Lower margins of tenth segment sinuous in side view, curving inwards and overlapping each other beneath the aedeagus. Cercus short, narrow, laterally compressed and slightly down-curved. Aedeagus long and slender, bearing a pair of asymmetric spines at its base, one slender, the other flattened and sinuous. There is a finger-like projection about half-way and within are two short, curved spines. Clasper moderately long, in side view tapering and curving up-

ward from a broad base to a rounded apex. From beneath, it is straight, diverging and slightly tapering. The outer apical angle ends in a short finger and there is a small black tooth on the inner margin just before the apex.

Length of fore wing, 3 mm.

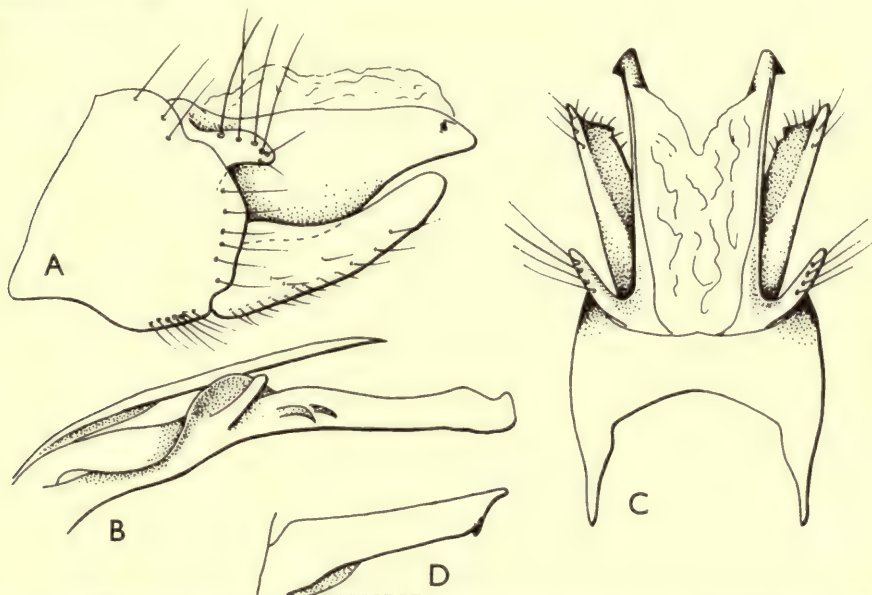


FIG. 3. *Synagapetus productus* sp. n. ♂ Genitalia. A, lateral; B, aedeagus, lateral; C, dorsal; D, left clasper, ventral.

♂ HOLOTYPE pinned, ♂ paratype, from which the illustrations have been made, lacking one fore wing and one hind wing, abdomen in glycerine. This species is closely related to *S. jafwi* Ross. It differs from that species in the more elongate, tapering tenth segment, which exceeds the claspers, and in the narrower cercus.

Family HYDROPTILIDAE

Orthotrichia obscura sp. n.

(Text-fig. 4)

PAPUA: Kokoda, 1,200 ft., ix. 1933, 1 ♂.

The pinned example was badly rubbed and has been made into a microscope preparation. All that can be said of its general appearance is that it was brownish. Antennae incomplete. In the fore wing, R_3 arises from R_2 in the normal manner.

♂ GENITALIA. Sixth segment with a short, acute ventral process. Tenth segment semi-membranous, fused to the ninth and somewhat asymmetric. Aedeagus with apex broken off in the holotype, probably long and slender. There is a curled spine arising about midway, directed caudad but direction may be variable. Alongside the aedeagus is a short, stout, sinuous spine, directed caudad. Claspers fused beneath to make a trapezoidal plate, tapering from base to apex in ventral view, slightly upcurved in side view. From beneath, the apex is

sinuously excised. At the base of the fused claspers, on the upper surface, is a trilobed plate, extending basally in a long, slender apodeme. The outer lobes are transparent, stout and digitate, each armed with a terminal bristle. The median lobe is more sclerotized, forming an arched, spatulate plate, longer than the side lobes. Apical margin of the ninth sternite with a quadrate excision at the centre.

Length of fore wing, ♂, 2.7 mm.

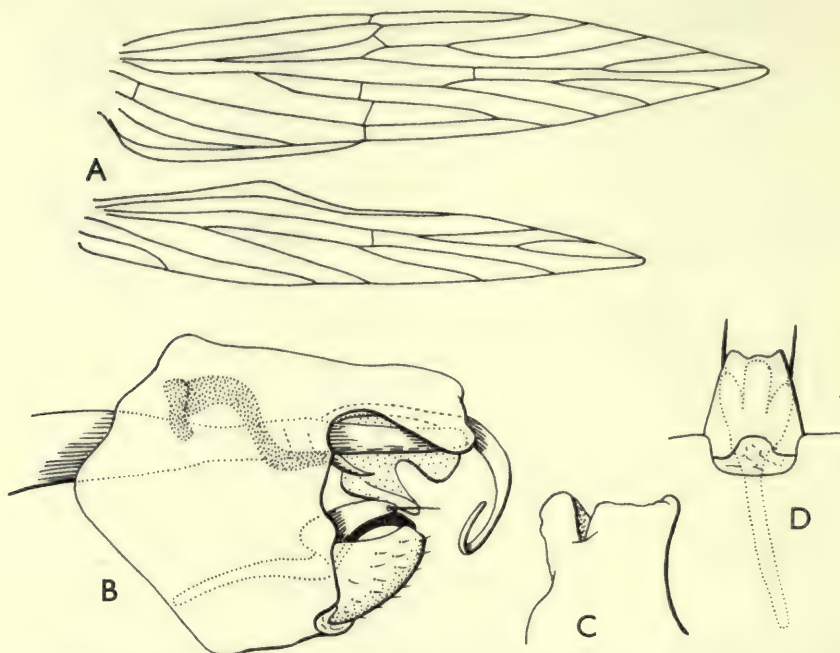


FIG. 4. *Orthotrichia obscura* sp. n. ♂. A, wings; B, genitalia, lateral; C, tenth segment, dorsal; D, claspers, ventral.

♂ HOLOTYPE mounted as microscope preparations, one hind wing missing. This species differs from *O. kokodana* sp. n. in the more completely fused, trapezoidal claspers, the shorter, sinuous spine alongside the aedeagus, R_3 arising from R_2 in the fore wing and Cu_1 unforked in the hind wing.

Orthotrichia kokodana sp. n.

(Text-fig. 5)

PAPUA: Kokoda, 1,200 ft., viii. 1933, 1 ♂.

The pinned example was badly rubbed and all that can be said of its general appearance is that it was fuscous, with pale golden hairs on head and thorax. The antennae are incomplete. In the fore wing, R_3 arises from the stem of R_{4+5} and in the hind wing, Cu_1 terminates in a small fork.

♂ GENITALIA. Sixth sternite with a small, acute ventral process. Ninth segment somewhat asymmetric, tenth segment fused to it, short, with a small excision on the left side, partly

separating it from the ninth. Aedeagus very long and slender, with a basally directed spiral tube encircling it about midway. Alongside the aedeagus is a long spiral spine, its apex projecting beyond the ninth segment. Claspers small, fused, in ventral view with their outer apical angles produced in short, blunt fingers. Above their fused bases arises a bilobed structure, each lobe carrying a single bristle, the structure extending basally in a long, slender apodeme.

Length of fore wing, ♂, 2.7 mm.

♂ HOLOTYPE mounted as a microscope preparation. At first I thought that this species would require a new genus, based upon the difference in venation from the

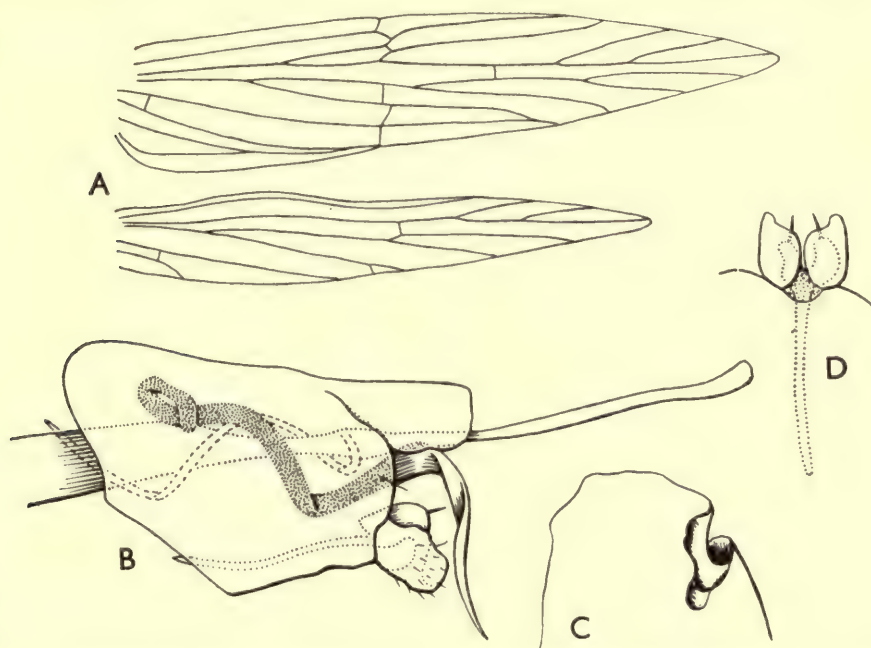


FIG. 5. *Orthotrichia kokodana* sp. n. ♂. A, wings; B, genitalia, lateral; C, ninth and tenth tergites, dorsal; D, claspers, ventral.

typical *Orthotrichia* wing. The male genitalia, too, are less asymmetric than is usual in this genus. Examination of other non-European species of *Orthotrichia* revealed that *O. moselyi* Tjeder from Anglo-Egyptian Sudan and *O. sanya* Mosely from Lake Nyasa both showed venation agreeing with *O. kokodana*, both have black scales on the costa of the fore wing and both have fairly asymmetric genitalia typical of *Orthotrichia*. I attach more importance to the similarity of the male genitalia than to the difference in venation, especially in such insects as the Hydroptilidae, where the narrowing of the wings has made the interpretation of the veins very much a matter of opinion at times. In Ulmer's key to the Hydroptilidae of the Sunda Islands, this species runs out to *Javanotrichia* but differs in having M_{1+2} in the hind wing not attached to R_{4+5} .

There is a single female from the same locality, dated vii. 1933, which may belong to this species. In the fore wing, R_3 arises from the stem of R_{4+5} . With so little material I shall do no more than mention it.

***Hydroptila bispina* sp. n.**

(Text-figs. 6-7)

PAPUA: Kokoda, 1,200 ft., ix. 1933, 32 ♂.

General appearance dull ochraceous, fore wing pale fuscous, with patches of ochraceous pubescence. Head with the usual pyriform scent-organ caps, within which (in a cleared example)

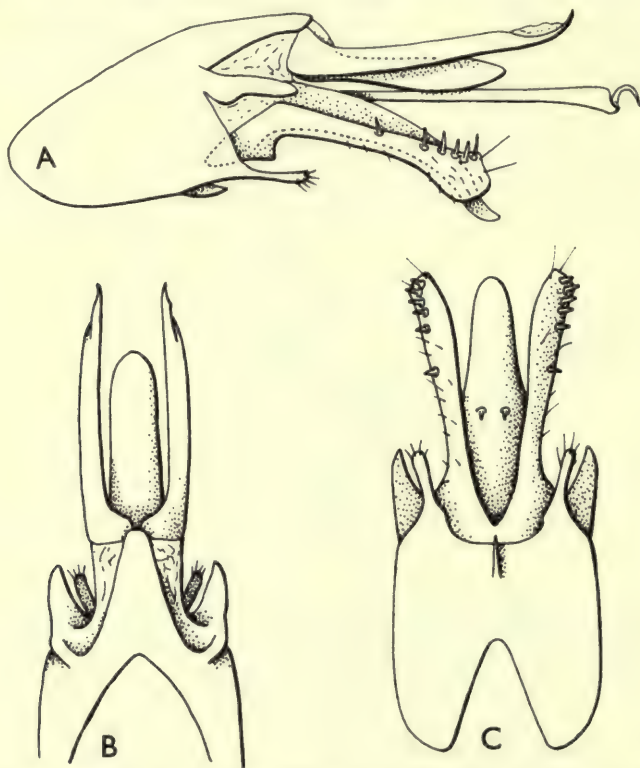


FIG. 6. *Hydroptila bispina* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth sternite and claspers, ventral.

can be seen a small, membranous scent-organ. Antennae with about thirty-five segments. Venation typical of *Hydroptila*.

♂ GENITALIA. Seventh segment with a small, acute ventral process. Ninth segment excised laterally, with a digitate side-piece arising from the base of the excision. In dorsal view, this side-piece is triangular. Ventral apical margin of segment produced on each side in a slender finger. Ventral surface of segment bears a small, acute, keel-like process. Tenth segment elongate, trilobed, median lobe rounded apically, lateral lobes spiniform, longer than median, apices slender and slightly upcurved. Aedeagus long and slender, with a small, terminal hook.

Claspers elongate, narrow, in side view each somewhat clavate apically, upper margin armed with peg-like teeth. Arising above the bases of the claspers is a tapering plate, about as long as the claspers and bearing two teeth on its lower surface.

Length of fore wing, ♂, 2.3 mm.

♂ HOLOTYPE mounted as microscope preparation. This species is related to *Hydroptila triloba* Kimmins (Guadalcanal) in the general structure of the male genitalia. It may be distinguished by the longer, spiniform lateral lobes of the tenth segment and the narrower, clavate claspers.

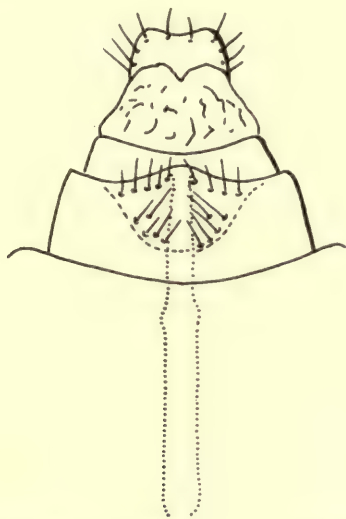


FIG. 7. *Hydroptila ?bispina* sp. n. ♀ Genitalia, ventral.

Amongst a number of female Hydroptilidae from Kokoda are four examples of a *Hydroptila*, which may well be the female of *H. bispina*. There is a distinctive subgenital plate on the eighth sternite, apical margin triangularly produced, basal margin indicated by a thickened line in the chitin, broadly rounded. The subgenital plate is set with bristles and it covers a long, slender tube, extending basally.

Family PHILOPOTAMIDAE

This family is represented in Miss Cheesman's collection by fifteen males and a number of females, belonging to the genus *Chimarra*. This genus is proving to contain a large number of species and the Papuan region is no exception, since these fifteen males belong to no less than nine species, all of which appear to be undescribed. Some of the species appear to be closely allied and since two stations in the Cyclops Mountains have produced seven species, it has not been found possible to associate females with males with any certainty. One species had already been described from New Guinea by Navás but I have not been able to identify his species with any of those collected by Miss Cheesman.

KEY TO MALES OF *Chimarra* SPECIES FROM NEW GUINEA

- 1 In hind wing, R_2 and R_3 remain fused. Ninth segment produced dorsally in two strong processes ***cyclopica* sp. n.**
- In hind wing, R_2 and R_3 separate. Ninth segment not so produced 2
- 2 In fore wing, R_s arises distinctly basad of base of thyridial cell, which is itself distad of intercubital cross-vein (acc. to Navás' figure) ***loriana* Navás**
- In fore wing, R_s arises at or distad of base of thyridial cell, which is basad of intercubital cell 3
- 3 Ventral process of ninth segment forming a slender finger, clavate in side view. Loop of $2A$ in hind wing incomplete 4
- Ventral process shorter, triangular in side view, keel-like. Loop of $2A$ in hind wing complete 6
- 4 Clasper in side view quadrate, about one and a half times as long as broad, its upper apical angle extended in a long, slender finger ***papuana* sp. n.**
- Clasper more elongately quadrate, with a short apical finger, or else gradually tapering from base to apex 5
- 5 Clasper in side view parallel-sided for most of its length, upper apical angle terminating in a short, curved finger ***schmidi* sp. n.**
- Clasper in side view tapering from base to apex, abruptly angled downwards shortly before apex ***sabrona* sp. n.**
- 6 Lateral lobes of tenth segment divided into an upper and a lower portion 7
- Lateral lobes not so divided 8
- 7 Lower branch of lateral lobe deep, convex ventrally. Clasper elongate, gently incurved ***cheesmanae* sp. n.**
- Lower branch narrow, straight ventrally. Clasper shorter, strongly incurved ***ulmeri* sp. n.**
- 8 Clasper in side view slightly upcurved, not sinuate 9
- Clasper in side view sinuately curved ***sinuata* sp. n.**
- 9 Lateral lobe of tenth segment from side with an irregularly excised upper margin. Clasper with a single, acute apex ***falcata* sp. n.**
- Lateral lobe of tenth segment from side with convex upper margin. Clasper with bifid apex ***kokodana* sp. n.**

***Chimarra cyclopica* sp. n.**

(Text-figs. 8–9)

DUTCH NEW GUINEA: Mt. Cyclops, 3,500 ft., iii. 1936, 2 ♂; Cyclops Mts., Sabron, Camp 2, 2,000 ft., vii. 1936, 3 ♂.

General appearance fuscous. Fore wing with cells R_2 and R_4 sessile, cell M_1 about as long as its footstalk, cell Cu_{1a} with a short footstalk. R_s sinuous, with a thickening before the discoidal cell, veins at base of discoidal cell also thickened. Median cell long. In hind wing, Sc and R_1 contiguous or fused, veins R_2 and R_3 fused (cell R_2 absent), cell R_4 sessile, cell M_1 about half as long as its footstalk, cell Cu_{1a} with a short footstalk.

♂ GENITALIA. Segment eight with tergite and sternite more or less fused, the sternite with a ventral process. Ninth segment also with a pointed ventral process. The dorsal apical margin is produced in a pair of spatulate processes, their apices slightly out-turned in dorsal view, gradually tapering in side view. From beneath their bases arise the lateral lobes of the tenth segment. Each lobe takes the form of a plate, set on edge, about as long as the process of the ninth segment, moderately deep, with an obliquely truncate apex in side view. The lobe is concave on its

interior surface and from above the apex is rounded. The upper margin has a triangular tooth near its base and there is another, much smaller, tooth on the apical margin. Median lobe membranous. It is possible that what have been termed processes of the ninth segment may be

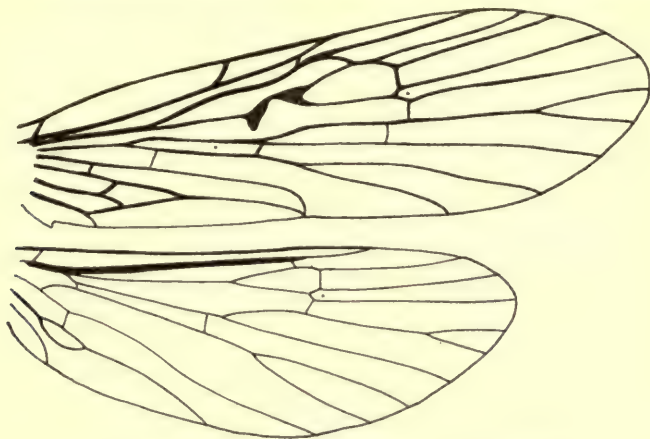


FIG. 8. *Chimarra cyclopica* sp. n. ♂ Wings.

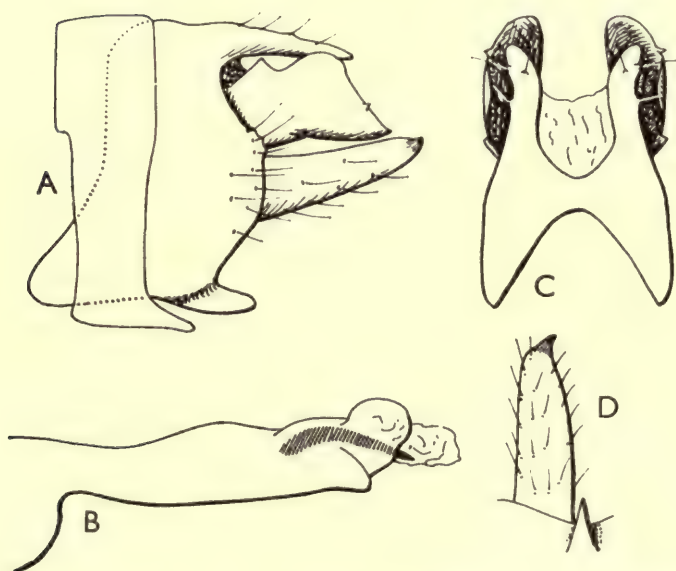


FIG. 9. *Chimarra cyclopica* sp. n. ♂ Genitalia. A, lateral; B, aedeagus, lateral; C, ninth and tenth segments, dorsal; D, left clasper, ventral.

part of the tenth segment, but they appear to be rigidly attached to the ninth, whereas the lateral lobes have some degree of movement. Aedeagus long, slender, with a bulbous base. The apex contains a single black spine. Clasper set just below the mid-lateral line of the segment, extending beyond the lateral lobes of the tenth segment, narrow and tapering in side view from base to

apex. In ventral view, they are parallel-sided for their basal two-thirds, then tapering to a blackened point.

Length of fore wing, ♂, 4.2 mm.

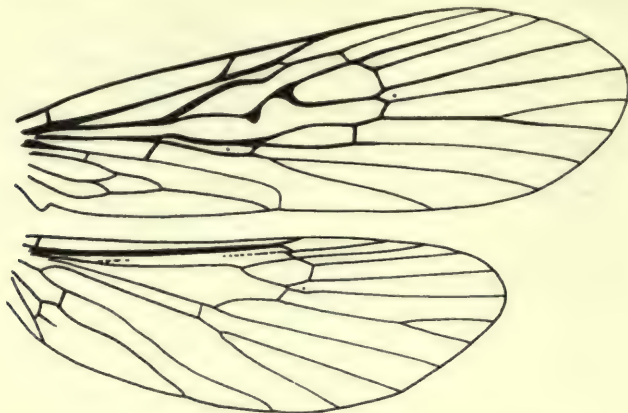


FIG. 10. *Chimarra papuana* sp. n. ♂ Wings.

♂ HOLOTYPE (Mt. Cyclops, iii. 1936) mounted as microscope preparations, ♂ paratypes cleared and preserved in glycerine. In the fusion of R_2 and R_3 in the hind wing, this species resembles the Australian species *uranka* Mosely, *australica* Ulmer and *monticola* Kimmins and also the Bornean species *montana* Kimmins. Like *uranka*, it has dorsal processes on the ninth segment but the form of the tenth segment and claspers is quite different.

Chimarra papuana sp. n.

(Text-figs. 10–11)

DUTCH NEW GUINEA: Mt. Cyclops, 3,500 ft., iii. 1936, 1 ♂.

General appearance fuscous. Venation much as in *C. schmidi* sp. n., even to the incomplete loop of 2A in the hind wing. Discoidal cell in fore wing relatively longer.

♂ GENITALIA. Eighth sternite produced in a triangular ventral process. Ninth segment with a long, straight ventral process. Tenth segment with the median lobe reduced to a membrane between the lateral lobes, apex with a V-shaped excision. Lateral lobes thin and plate-like, broad basally in side view, tapering to an elongate, slender apex. Cercus small and rounded. Aedeagus with an invaginated, membranous tube, which is densely covered with setae and spinules. Clasper from the side quadrangular, attached by one corner and with the upper apical angle produced in a long, slender, curved finger. From beneath, it is moderately broad at its base, tapering to a pointed apex and with a hooked process about half-way along the inner margin.

Length of fore wing, ♂, 4.1 mm.

♂ HOLOTYPE mounted as microscope preparations. This species differs from *cyclopica* in the presence of cell R_2 and the incomplete loop of 2A in the hind wing, the

prominent ventral process of the ninth segment and the absence of dorsal processes to this segment.

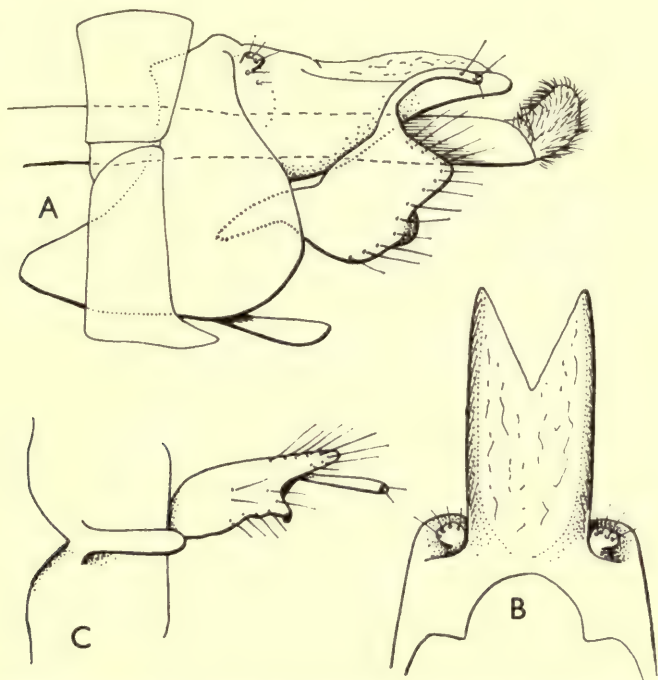


FIG. 11. *Chimarra papuana* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth segments, dorsal; C, ventral processes of eighth and ninth segments and left clasper, ventral.

***Chimarra schmidi* sp. n.**

(Text-figs. 12-13)

DUTCH NEW GUINEA: Mt. Cyclops, 3,500 ft., iii. 1936, 1♂.

General appearance fuscous. Fore wing with cells R_2 and R_4 sessile, cell M_1 slightly shorter than its footstalk, Cu_{1a} with a very short footstalk. Rs sinuous, with a thickening before the discoidal cell, whose veins at the base are also thickened. Median and thyridial cells short, the latter not reaching basad to the origin of Rs . In the hind wing, cells R_2 and R_4 sessile, the former rather narrow, cell M_1 with a long footstalk, Cu_{1a} with a short footstalk, loop of $2A$ incomplete.

♂ GENITALIA. Eighth tergite and sternite distinct, the latter with a strong ventral process. Ninth segment with an outstanding ventral process, with a slightly dilated apex in side view. Tenth segment three-lobed, median lobe membranous, tapering to an acute apex dorsally and covered with microscopic setae. Lateral lobes forming a pair of thin plates, one on each side of aedeagus. Each lobe is deep at its base, with a small, rounded cercus at its upper basal angle, and tapers to a blunt apex with a small, blackened tooth at the lower angle. Two setiferous sensillae on the upper margin about midway. Aedeagus slender, cylindrical, enclosing two black spines. Clasper arising near the ventral margin, narrowed at its base in side view, parallel-sided for

most of its length, then suddenly narrowing to a short, digitate apex armed with three or four bristles. In ventral view it is falcate, base broad, inner margin bluntly serrate in basal half.

Length of fore wing, ♂, 4.5 mm.

♂ HOLOTYPE mounted as microscope preparation. Closely related to *papwana* sp. n. in venation and general pattern of genitalia, this species differs in the more

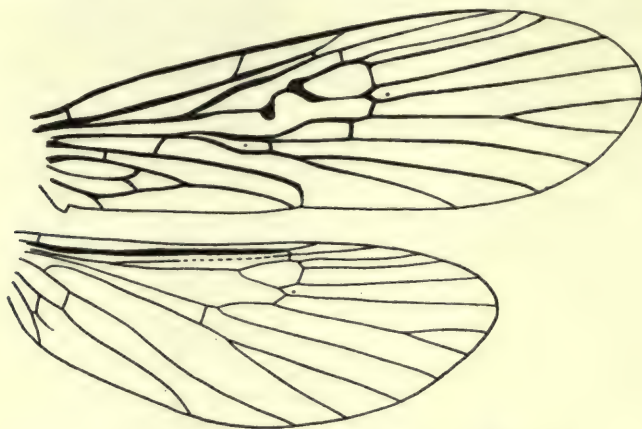


FIG. 12. *Chimarra schmidi* sp. n. ♂ Wings.

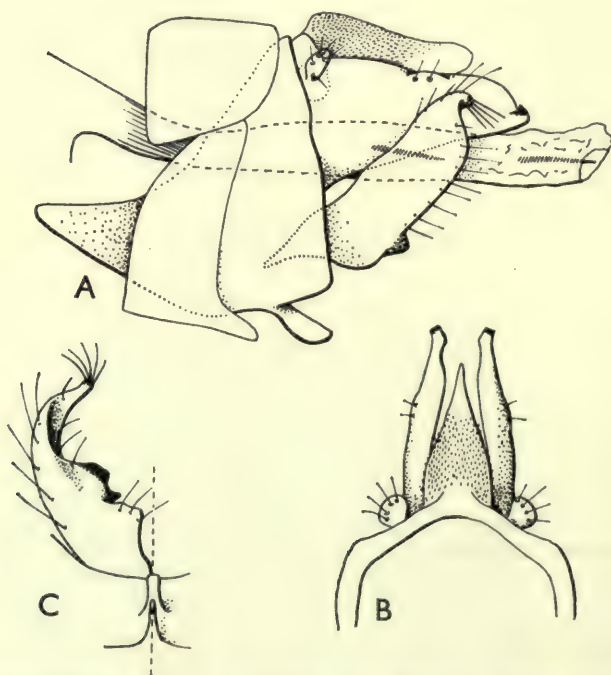


FIG. 13. *Chimarra schmidi* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth segments, dorsal; C, ventral processes of eighth and ninth segments and left clasper, ventral.

slender, quadrate clasper, with a shorter apical finger, the clasper in ventral view more strongly incurved. The tenth segment in side view is broader. I have much pleasure in naming this species after Dr. Fernand Schmid, the eminent Trichopterist of the Musée Zoologique, Lausanne.

Chimarra sabrona sp. n.

(Text-fig. 14)

DUTCH NEW GUINEA : Cyclops Mts., Sabron, Camp 2, 2,000 ft., vi. 1936, 2 ♂.

General appearance fuscous. Venation much as in *C. schmidi*, cell M_1 in the fore wing with a slightly shorter footstalk.

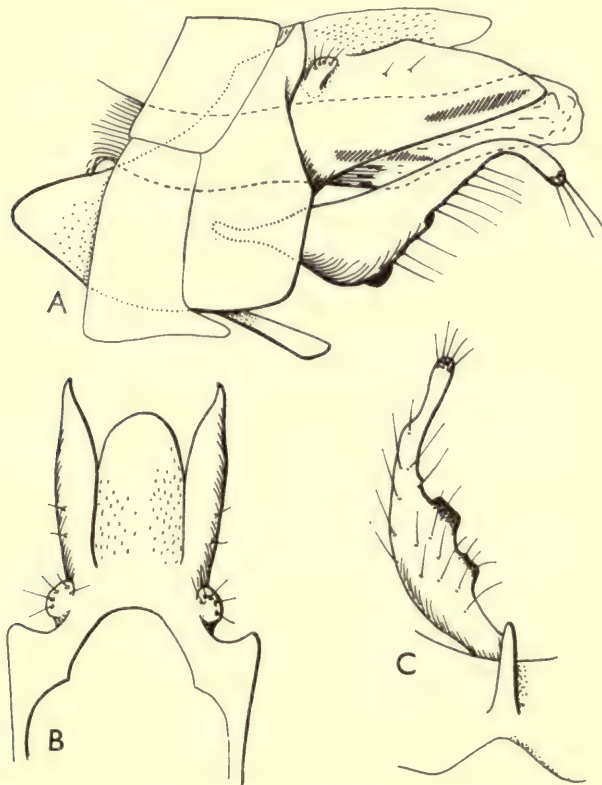


FIG. 14. *Chimarra sabrona* sp. n. ♂ Genitalia. A, lateral ; B, ninth and tenth segments, dorsal ; C, ventral processes of eighth and ninth segments and left clasper, ventral.

♂ GENITALIA : Allied to *C. schmidi* but differing in detail. Eighth sternite with a broad, rounded ventral process. Ventral process of ninth segment long, straight, slightly dilated and obliquely truncate. Tenth segment three-lobed, median lobe membranous, a little shorter than lateral lobes, apex rounded. Lateral lobes thin, plate-like, from the side broad at the base, lower margin straight, upper curving down to a rounded apex. No teeth at apex, two setiferous

sensillae towards upper margin. Cercus short, situated at upper basal angle of lateral lobe. Aedeagus cylindrical, containing two straight, black spines and an invaginated tube covered with microscopic setae. Clasper from the side broad near the base, tapering gradually to a down-curved, slender finger, tipped with a few bristles. From beneath, it is gently incurved, narrow at its base, gradually dilating to about midway, then constricting to a narrow finger. Inner margin with two blunt, blackish projections.

Length of fore wing, ♂, 3.2 mm.

♂ HOLOTYPE mounted as microscope preparation, ♂ paratype pinned. This species differs from *schmidi* in the shape of the claspers, which are gradually tapered instead of parallel-sided, and are less strongly curved in ventral view.

***Chimarra ulmeri* sp. n.**

(Text-figs. 15-16)

PAPUA: Kokoda, 1,200 ft., vi-vii. 1933, 1 ♂, 3 ♀.

Head fuscous, darker between the ocelli, with sparse golden hairs. Antennae and palpi incomplete. Thorax fuscous, with golden hairs. Wings (rather denuded) pale fulvous, with traces of fuscous pubescence.

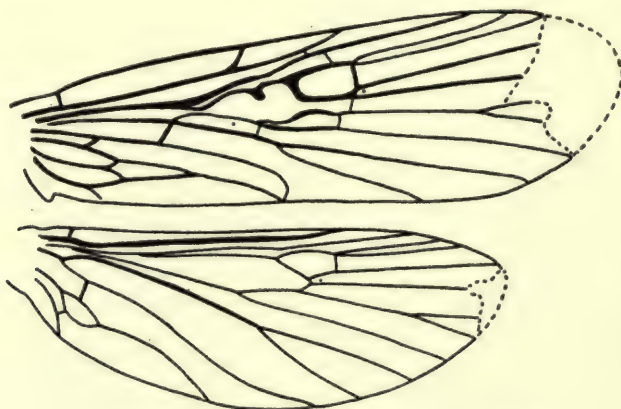


FIG. 15. *Chimarra ulmeri* sp. n. ♂ Wings.

♂ GENITALIA. Ninth segment reduced to a narrow band dorsally, ventrally long and with a median, keel-like process. Tenth segment with median lobe membranous, lateral lobes strongly sclerotized. Each lateral lobe is divided into two branches, the upper the shorter, angled upwards and with an acute apex. The lower branch is directed tailward, its lower margin straight, the upper with a rounded excision before the truncate apex, which carries two sensillae. Cercus laterally compressed, rounded in side view, short. Aedeagus cylindrical, the lower apical margin produced in a long, slender lobe. Two long spines and a pair of spines can be seen within the membrane. Clasper small, about as long as tenth segment, from the side gradually tapering

to an acute apex. From beneath, it is abruptly angled inwards at about midway, and with a serrate projection of the inner margin at the base.

Length of fore wing, ♂, 4.7 mm.

♂ HOLOTYPE pinned, one pair of wings mounted dry, abdomen in glycerine. This species resembles in male genitalia *C. thienemanni* Ulmer from Java. It differs in the shorter, more abruptly angled claspers and in the form of the tenth segment. The

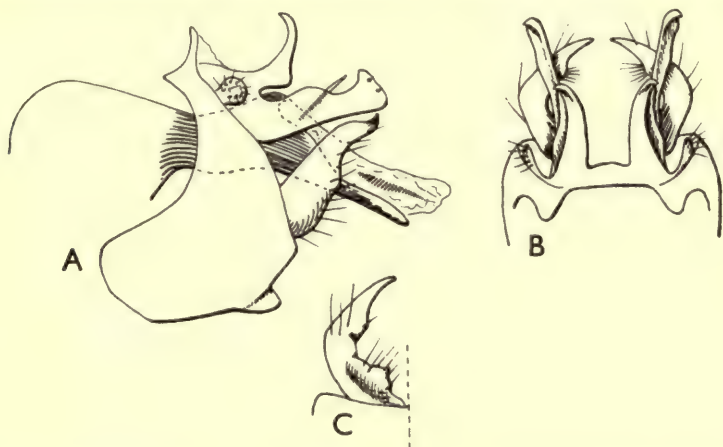


FIG. 16. *Chimarra ulmeri* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth segment, dorsal; C, left clasper, ventral.

three females are referred here with some doubt, chiefly on the evidence of the rather narrow cell R_2 in the hind wing. This species is named after Dr. Georg Ulmer, who has done so much to further our knowledge of the Trichoptera and who is always willing to assist other workers from his store of knowledge.

Chimarra cheesmanae sp. n.

(Text-figs. 17-18)

DUTCH NEW GUINEA: Cyclops Mts., Mt. Lina, 3,500-4,000 ft., iii. 1936, 1 ♂.

Specimen brownish, in poor condition. Wings with fuscous pubescence. Fore wing with R_s only slightly curved, base of discoidal cell not much thickened. Median cell moderately long. Cell Cu_{1a} short, about as long as its footstalk.

♂ GENITALIA. Eighth sternite produced at the centre of its apical margin in a thin, triangular plate. Ninth segment with a short ventral keel. Tenth segment about as long as ninth, fused to it, and about half as deep. Median lobe membranous. Lateral lobes bifid, upper branches membranous, lower branches forming deep convex plates, more or less encircling the aedeagus, rounded apically and with sinuous ventral margins in side view. Lateral margins each with a small tooth or sensilla. Cercus small. Aedeagus with two stout, straight, internal spines. Clasper

moderately long, upcurved and tapering in side view ; from beneath, stout basally, tapering to about midway, apex incurved and acute. There is a stout tooth about half-way along the inner margin.

Length of fore wing, ♂, 4 mm.

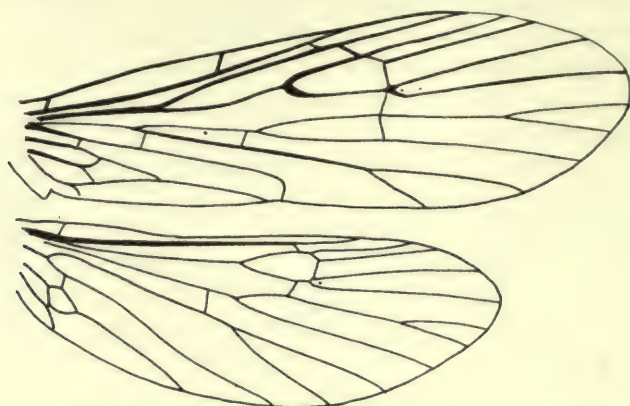


FIG. 17. *Chimarra cheesmanae* sp. n. ♂ Wings.

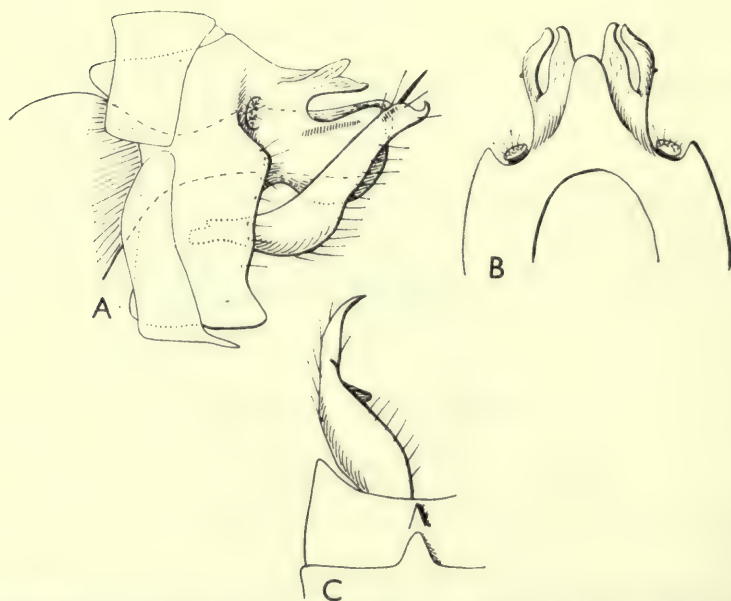


FIG. 18. *Chimarra cheesmanae* sp. n. ♂ Genitalia. A, lateral ; B, ninth and tenth segments, dorsal ; C, ventral processes of eighth and ninth segments and claspers, ventral.

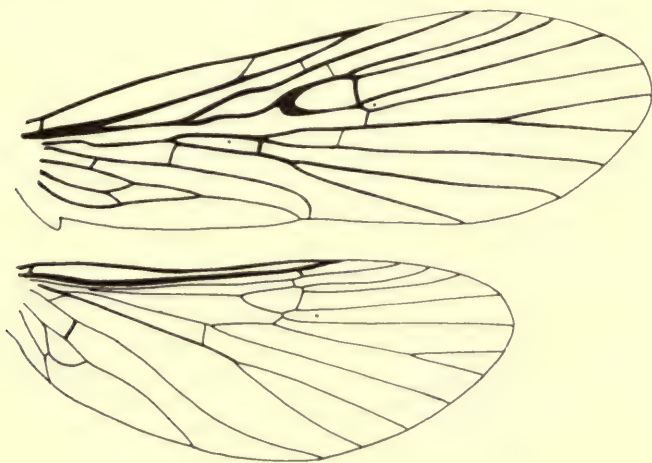
♂ HOLOTYPE mounted as microscope preparations. This species may be distinguished from *ulmeri* by the deeper, more convex lower branches of the tenth segment, the more elongate clasper and the presence of a ventral process to the eighth sternite.

Chimarra falcata sp. n.

(Text-figs. 19-20)

DUTCH NEW GUINEA: Mt. Cyclops, 3,500 ft., iii. 1936, 2 ♂.

Head ochraceous, fuscous between the ocelli and at the sides of the occiput, pubescence golden. Antennae and palpi fuscous. Thorax reddish fuscous, legs brownish with darker spurs, hind tibia fuscous. Wings fuscous, with reddish fuscous pubescence. Fore wing with R_s sinuous, base of discoidal cell with veins much thickened; cells R_2 and R_4 sessile, cell M_1 about as long as its footstalk, cell Cu_{1a} with short footstalk. In hind wing, cells R_2 and R_4 sessile, cell M_1 shorter than its footstalk, cell Cu_{1a} with a short footstalk.

FIG. 19. *Chimarra falcata* sp. n. ♂ Wings.

♂ GENITALIA. Eighth segment short, with tergite and sternite more or less fused into a complete ring. Ninth segment short above, with a small, keel-like ventral process in centre of sternite. Tenth segment more or less fused to ninth, median lobe reduced to membrane, lateral lobes long and narrow, each with a single sensilla on upper surface towards apex. The upper surface has an incurving ridge about midway. Cercus short, laterally compressed. Aedeagus cylindrical, with a bulbous base and an obliquely truncate apex. Within the enclosed membrane can be seen a pair of straight, black spines, a single, pale, curved spine and a patch of spinules. Clasper directed upward, apex curving inward above the tenth segment. Seen from beneath and behind, it is acutely falcate, arising from a short, broad base.

Length of fore wing, ♂, 5.4 mm.

♂ HOLOTYPE mounted as microscope preparations, ♂ paratype pinned, with abdomen in glycerine. *C. falcata* differs from the two preceding species in having the lateral lobe of the tenth segment entire.

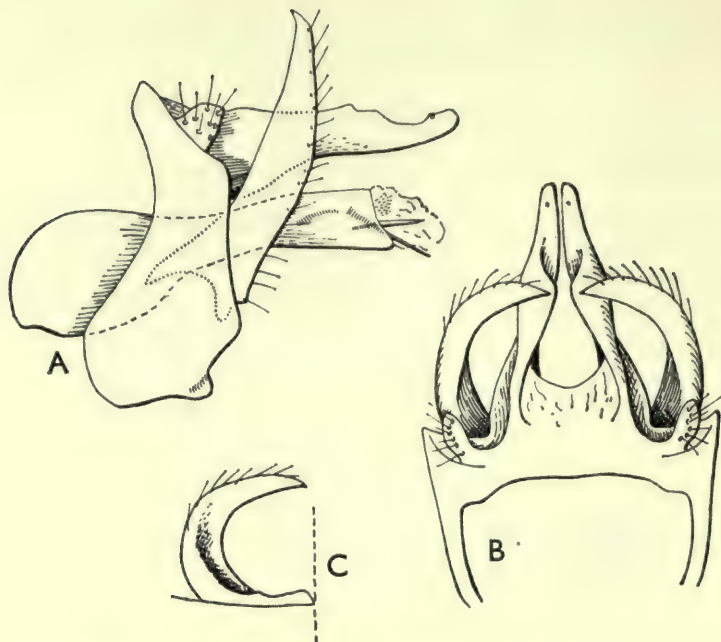


FIG. 20. *Chimarra falcata* sp. n. ♂ Genitalia. A, lateral; B, dorsal (aedeagus omitted); C, left clasper, ventral.

***Chimarra sinuosa* sp. n.**

(Text-figs. 21-22)

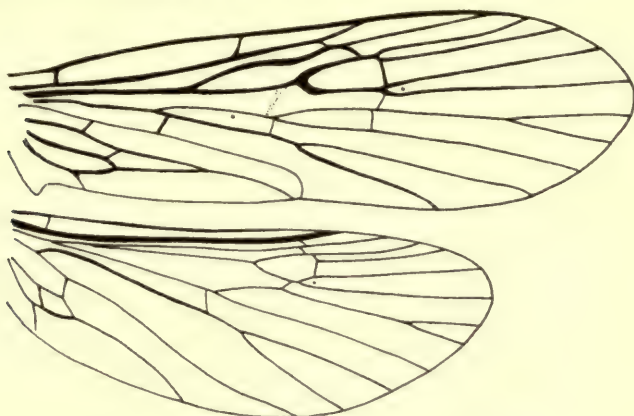
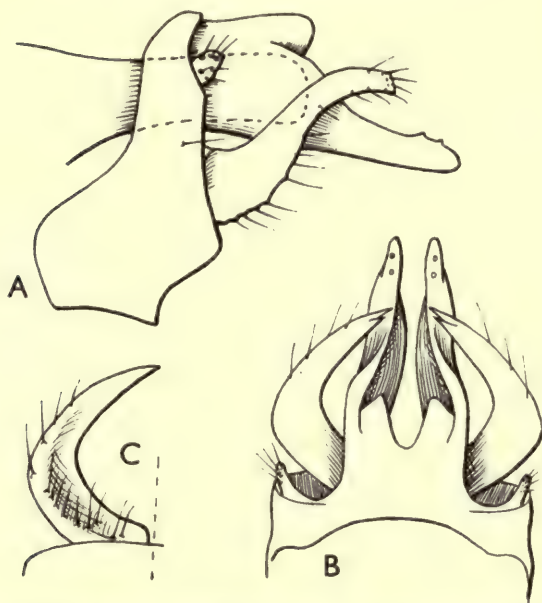
DUTCH NEW GUINEA: Cyclops Mts., Sabron, Camp 2, 2,000 ft., vii. 1936, 1 ♂.

Type in poor condition, somewhat moulded. General colour brownish. Venation much as in *C. falcata*, but *Rs* in fore wing only slightly curved.

♂ GENITALIA. Eighth segment more or less divided into tergite and sternite. Ninth segment narrowed above, in side view with upper margin slightly produced; ventrally with a small, keel-like process. Tenth segment partially fused to ninth, median lobe short, excised at its centre, lateral margins sclerotized, projecting above the base of the lateral lobe. The latter is elongate, tapering apically, with two sensillae on upper surface at apex. From above, the upper margin is sinuous, lower margin incurved. Cercus short, laterally compressed. Clasper falcate, from above acute apically, with a short, acute tooth just above the apical one. From the side, the clasper is sinuous, curving upward and then tailward and inward over the tenth segment.

Length of fore wing, ♂, 4.7 mm.

♂ HOLOTYPE in glycerine, one pair of wings mounted dry. This species is closely related to *falcata*, from which it differs in the straighter *Rs* in the fore wing, the more sclerotized median lobe of the tenth segment, the produced apical margin of the ninth segment and the sinuously curved, bidentate claspers.

FIG. 21. *Chimarra sinuosa* sp. n. ♂ Wings.FIG. 22. *Chimarra sinuosa* sp. n. ♂ Genitalia. A, lateral ; B, dorsal (aedeagus omitted) ; C, left clasper, ventral.***Chimarra kokodana* sp. n.**

(Text-figs. 23-24)

PAPUA : Kokoda, 1,200 ft., viii. 1933, 1 ♂, 1 ♀.

Head and thorax ochraceous, with golden hairs, antennae fulvous. Palpi (incomplete) fulvous, becoming darker towards apices. Legs ochraceous, spurs pale fuscous. Wings hyaline, with pale golden or ochraceous pubescence, slightly darker over the anastomosis. In fore wing, R_1 and R_2 both strongly sinuous, thyridial cell long and narrow.

♂ GENITALIA. Ninth segment rather short, with a short ventral protuberance at its base. Tenth segment with median lobe membranous, lateral lobes elongate, plate-like, from the side tapering from midway to a rounded apex, carrying a group of four or five sensillae on its upper margin. From beneath, the lateral lobes are parallel-sided, apices slightly dilated and out-turned.

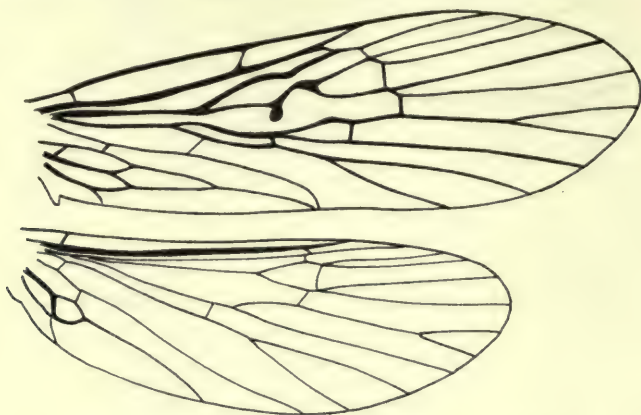


FIG. 23. *Chimarra kokodana* sp. n. ♂ Wings.

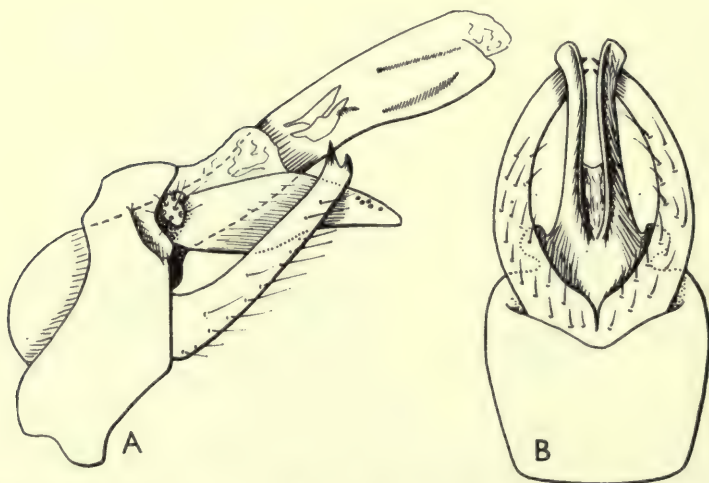


FIG. 24. *Chimarra kokodana* sp. n. ♂ Genitalia. A, lateral; B, from behind and below.

Cercus short, rounded, projecting laterally, at base of tenth segment. Aedeagus long, cylindrical, enclosing three pairs of spines. Clasper falcate from behind, slender, curving upward over the tenth segment. Its apex terminates in two acute teeth.

Length of fore wing, ♂, 3.8 mm.

♂ HOLOTYPE pinned, with one pair of wings mounted dry, abdomen in glycerine. This species is related to *falcata* and *sinuosa*, but differs in the more sinuate R_1 and

Rs in the fore wing, the less strongly falcate claspers, which are not sinuate, and the less developed ventral process. The female is referred here with some doubt.

Chimarra spp.

PAPUA: Kokoda, 9,200 ft., vi-ix. 1933, 5 ♀.

PAPUA: Mt. Tafa, 8,500 ft., iii. 1934, 1 ♀.

PAPUA: Mondo, 5,000 ft., i-ii. 1934, 1 ♀.

DUTCH NEW GUINEA: Mt. Cyclops, 3,500 ft., iii. 1936, 10 ♀; Sabron, Camp 2, 2,000 ft., vii. 1936, 1 ♀.

I have been unable to associate these specimens with any of the species described in the present paper.

Family POLYCENTROPODIDAE

KEY TO PAPUAN SPECIES OF *Polycentropus* (MALES)

- 1 Fore wing with numerous spots of golden pubescence on a brown ground *grandis* sp. n.
- Fore wing without spots of golden pubescence 2
- 2 Membrane of fore wing with hyaline spots or areas (in addition to those bordering the *R*₁-*Rs* and *r-m* cross-veins, the cross-vein closing the median cell, and at the base of this cell) 3
- Membrane of fore wing without hyaline areas or spots other than those listed above 4
- 3 Fore wing with three large hyaline areas, apical margin of wing distinctly sinuate *sinuosus* sp. n.
- Fore wing with numerous hyaline spots, apical margin of wing less sinuate *moselyi* sp. n.
- 4 Prothorax yellow, with golden hairs *auricollis* sp. n.
- Prothorax fuscous, with dark hairs 5
- 5 Male cerci simple, without inner branches, paraproctal hooks scarcely divergent *piceus* sp. n.
- Male cerci with inner branches, paraproctal hooks strongly divergent at apices 6
- 6 Cerci in lateral view a little more than twice as long as broad, paraproctal hooks simple at apices; claspers in ventral view one and a half times as long as broad *rosselinus* Navás
- Cerci three times as long as broad, paraproctal hooks bifid at apices; claspers in ventral view two and a half times as long as broad *similis* sp. n.

Polycentropus australis Ulmer is not included in the key but is possibly closely related to either *P. rosselinus* or *P. similis*.

Polycentropus grandis sp. n.

(Text-figs. 25-27)

PAPUA: Mt. Tafa, 8,500 ft., iii. 1934, 10 ♂, 4 ♀; Mondo, 5,000 ft., i-ii. 1934, 1 ♂, 1 ♀.

Head yellowish brown, densely clothed above with golden hairs, shading to dark brown laterally. Antennae fuscous, faintly annulated with yellowish brown. Palpi yellowish brown. Thorax brownish, with median tufts of golden hairs and fuscous tufts at the tegulae. Legs golden brown. Abdomen brownish. Fore wing densely clothed with brownish pubescence, upon

which are scattered circular spots of golden pubescence, not very numerous, with four or five larger patches along the posterior margin. Membrane brownish, with similar pale yellowish spots. Hind wing with smoky brown membrane, sparsely clothed with yellowish pubescence.

♂ GENITALIA. Ninth segment membranous above and merged with the tenth, which projects as a short tube or hood, to whose lower lateral margins are fused the more sclerotized paraprocts,

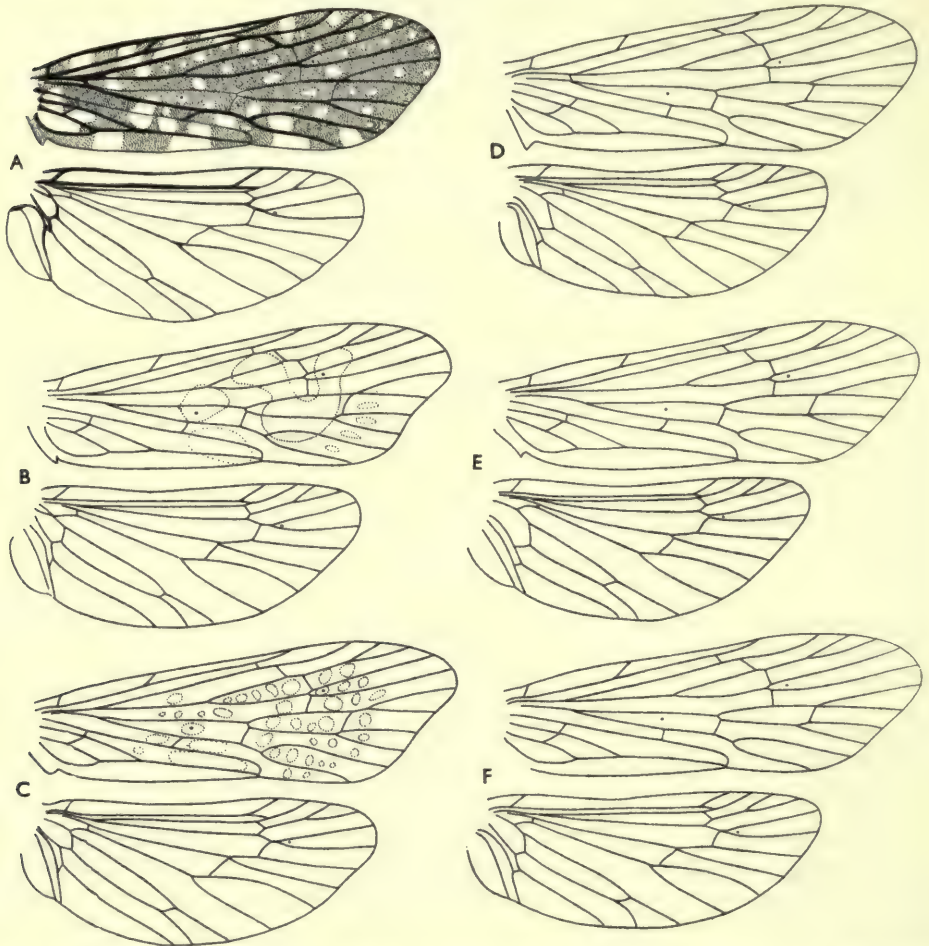


FIG. 25. Wings of *Polycentropus* spp. n. A, *grandis*; B, *sinuosus*; C, *moselyi*; D, *auricollis*; E, *piceus*; F, *similis*.

which project as small, setose lobes apically. Cerci forming tapering lobes, directed upwards and mesally over the tenth segment, each with a long, straight spine hinged to its apex. A slender, finger-like process arises from the inner surface of the cercus about midway. Aedeagus cylindrical, arising from a bulbous base. Claspers spatulate, divergent, in ventral view rather broader at their bases, apices rounded. In side view, each clasper carries a flattened, blackish basal branch on its upper surface, about two-thirds as long as main branch, its apex somewhat clavate in ventral view. Upper surface of main branch with a median, blackish ridge.

♂ GENITALIA. Ninth segment membranous above, lightly sclerotized and largely withdrawn within the eighth tergite. Lateral gonapophyses bluntly foliate, about as long as eighth tergite. Subgenital plate of eighth segment forming a tapering scoop, situated between the lateral gonapophyses.

Length of fore wing, ♂, 10-11 mm., ♀, 13-14 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype with abdomen cleared and preserved in glycerine, and paratypes pinned. The large size and boldly

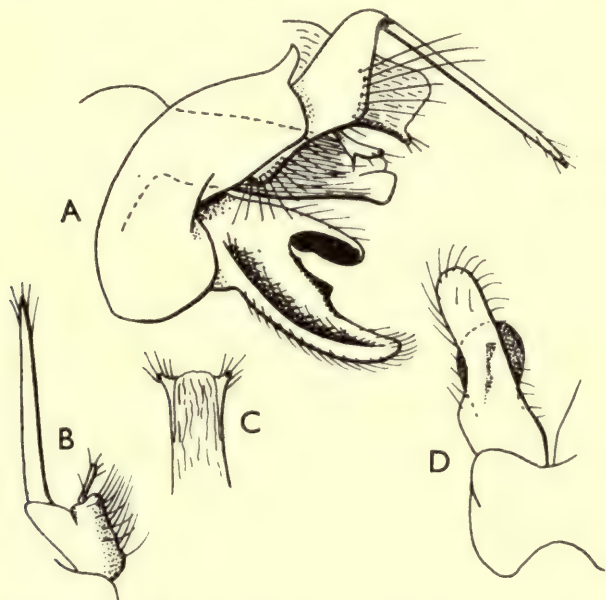


FIG. 26. *Polycentropus grandis* sp. n. ♂ Genitalia. A, lateral; B, left cercus, dorsal; C, tenth segment and paraprocts, dorsal; D, clasper and ninth segment, ventral.

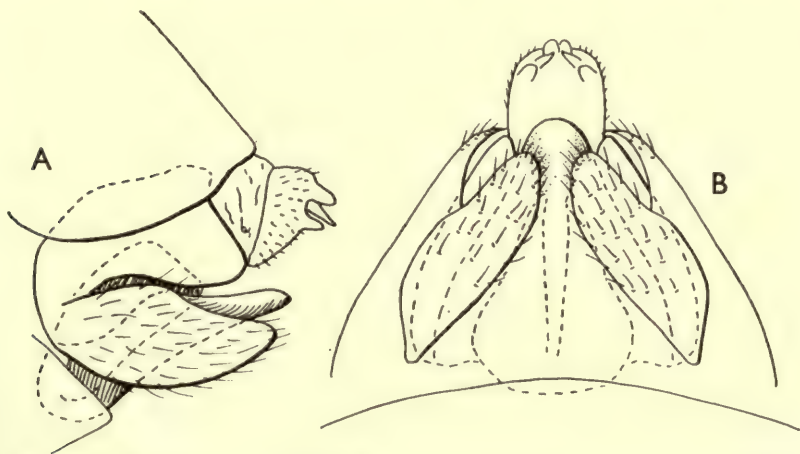


FIG. 27. *Polycentropus grandis* sp. n. ♀ Genitalia. A, lateral; B, ventral.

spotted wings will distinguish this species from any of the Papuan *Polycentropus* spp. described so far. In structure of the male genitalia, it is related to the *P. maculatus* group of species from North America. It also shows some resemblance to *Polyplectropus grandis* Banks, both in wing pattern and in male genitalia, but Dr. W. L. Brown, of the Museum of Comparative Zoology, Cambridge, Mass., confirms that there is no cubito-anal cross-vein nor fork R_2 in the hind wing of *grandis* Banks, which therefore cannot be a *Polycentropus*.

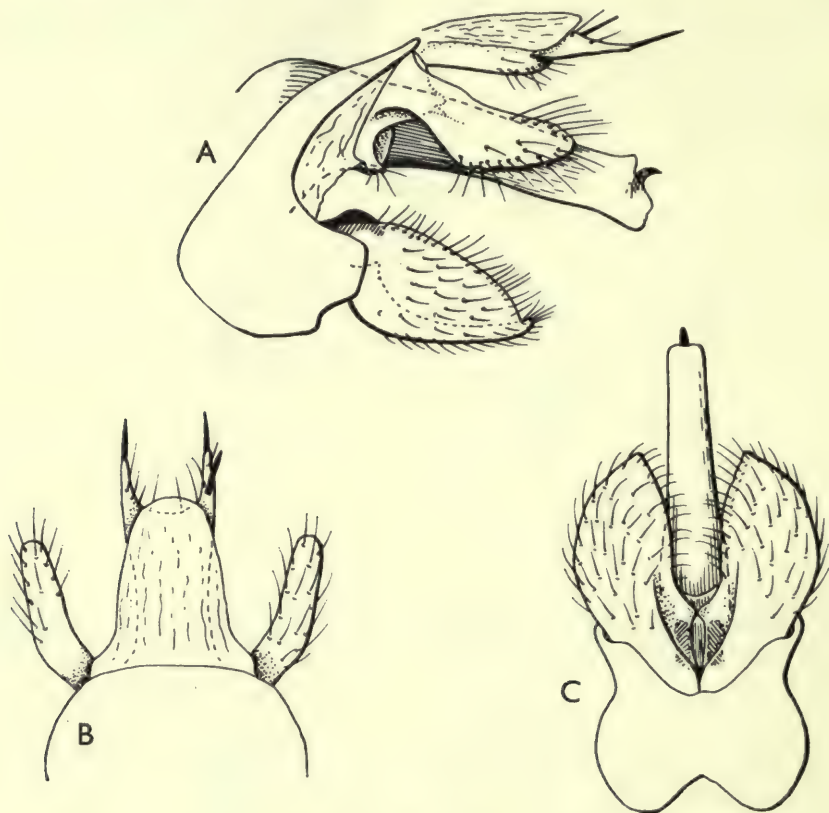


FIG. 28. *Polycentropus sinuosus* sp. n. ♂ Genitalia. A, lateral; B, cerci, tenth segment and paraprocts, dorsal; C, claspers and aedeagus, ventral.

***Polycentropus sinuosus* sp. n.**

(Text-figs. 25, 28)

PAPUA: Kokoda, 1,200 ft., vi. 1933, 2 ♂; Matsika, 3,000 ft., xii. 1933, 1 ♂.

Head fuscous, with dark reddish brown hairs. Antenna stout, fuscous, with paler annulations. Palpi fulvous. Thorax and abdomen fuscous, the former with dark reddish brown hairs. Fore wing densely clothed with golden brown pubescence; membrane pale brownish, with an irregular pale marking in the centre of the wing, somewhat resembling a question mark, and a few smaller

spots. Hind wing sparsely pubescent, membrane hyaline. Apical margin of fore wing with a shallow, sinuous excision.

♂ GENITALIA. Tenth segment fused with ninth, membranous in its upper part. To its lower surface are fused the more sclerotized paraprocts, which terminate in short fingers, carrying one or two stout, black spines and with a number of finer setae on the ventral surface of the tenth segment, which is slightly keeled. Cercus about as long as ninth segment, narrow basally in side view, dilated on its lower surface about midway. On its inner surface are two short branches, the upper consisting of a small lobe bearing a short finger, and the lower a small, curved lobe bearing setae. Aedeagus cylindrical, straight, armed at its apex with a single, blackened claw. Clasper short and broad, forming a foliate scoop with a pointed apex, upper basal branch small and black.

Length of fore wing, ♂, 7-8 mm.

♂ HOLOTYPE mounted as microscope preparations (Kokoda, vi. 1933), ♂ paratypes pinned. In the reduced paraprocts, this species shows some resemblance to *P. grandis* sp. n., but is readily separable from that species by the unicolorous wings and by the form of the cercus, which is not produced apically in a long, straight spine.

Polycentropus moselyi sp. n.

(Text-figs. 25, 29)

PAPUA: Mondo, 5,000 ft., i-ii. 1934, 1 ♂, 1 ♀.

Head fuscous with brownish hairs. Palpi fuscous. Antennae dark fulvous, with paler annulations. Thorax fuscous, with brown hairs. Legs dark fulvous. Abdomen fuscous. Fore wing clothed with reddish brown pubescence, membrane pale brownish, with numerous pale spots. Apical margin slightly excised.

♂ GENITALIA. Somewhat similar in pattern to *P. sinuosus* sp. n. The membranous tenth segment is fused with the ninth and with the paraprocts, which project as lateral fingers beyond the tenth. Each carries a few small setae but no strong spines. The cercus is more gently clavate and rounded apically in side view, with one or two small processes on the inner surface towards the apex. At its base on the inner surface there are two processes (as in *sinuosus*) but the upper one is much longer and slender. Aedeagus rather short and stout, without apical claw. Clasper from the side longer and narrower, tapering from base to apex, inner margin raised up about midway in a strong, acute tooth. Upper basal branch arising almost at right angles, slender, clavate apically. From beneath, the clasper is also longer and narrower than in *sinuosus*, truncate apically.

♀ GENITALIA. Lateral gonapophyses long and broadly ovate. Subgenital plate from beneath broad and trilobed, apex of median lobe projecting beyond lateral gonapophyses. Between the subgenital plate and ninth segment is a large pocket on each side, lined with dense setae.

Length of fore wing, ♂, 10 mm., ♀, 11 mm.

♂ HOLOTYPE pinned, one pair of wings mounted dry between celluloid, abdomen in glycerine, ♀ allotype pinned, abdomen in glycerine. This species (the male of which was identified by Mosely as *P. australis* Ulmer) is closely related to *P. sinuosus* sp. n. and in addition to the differences in the male genitalia, may be distinguished by the spotted membrane of the fore wing. I was quite prepared to accept Mosely's determination of the pinned insect until I made a preparation of the abdomen, which revealed too many features not reconcilable with Ulmer's figure.

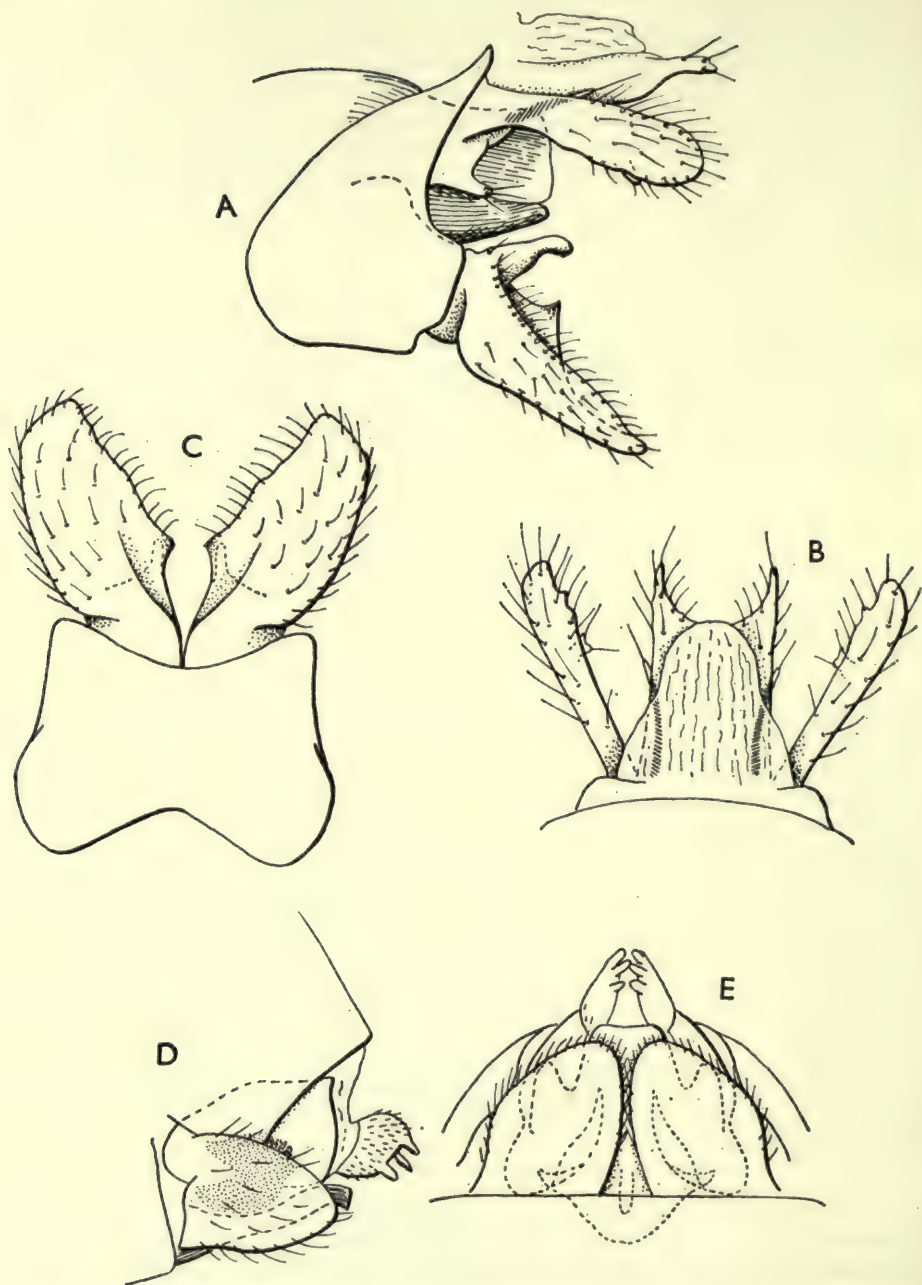


FIG. 29. *Polycentropus moselyi* sp. n. Genitalia. ♂, A-C, ♀, D-E. A, lateral; B, cerci, tenth segment and paraprocts, dorsal; C, claspers, ventral; D, lateral; E, ventral.

Polycentropus auricollis sp. n.

(Text-figs. 25, 30)

PAPUA: Kokoda, 1,200 ft., vii, ix. 1933, 4♂, 11 ♀.

General appearance dark brown as in *P. piceus* sp. n., but distinguishable from that species by the yellow prothorax, clothed with golden hairs.

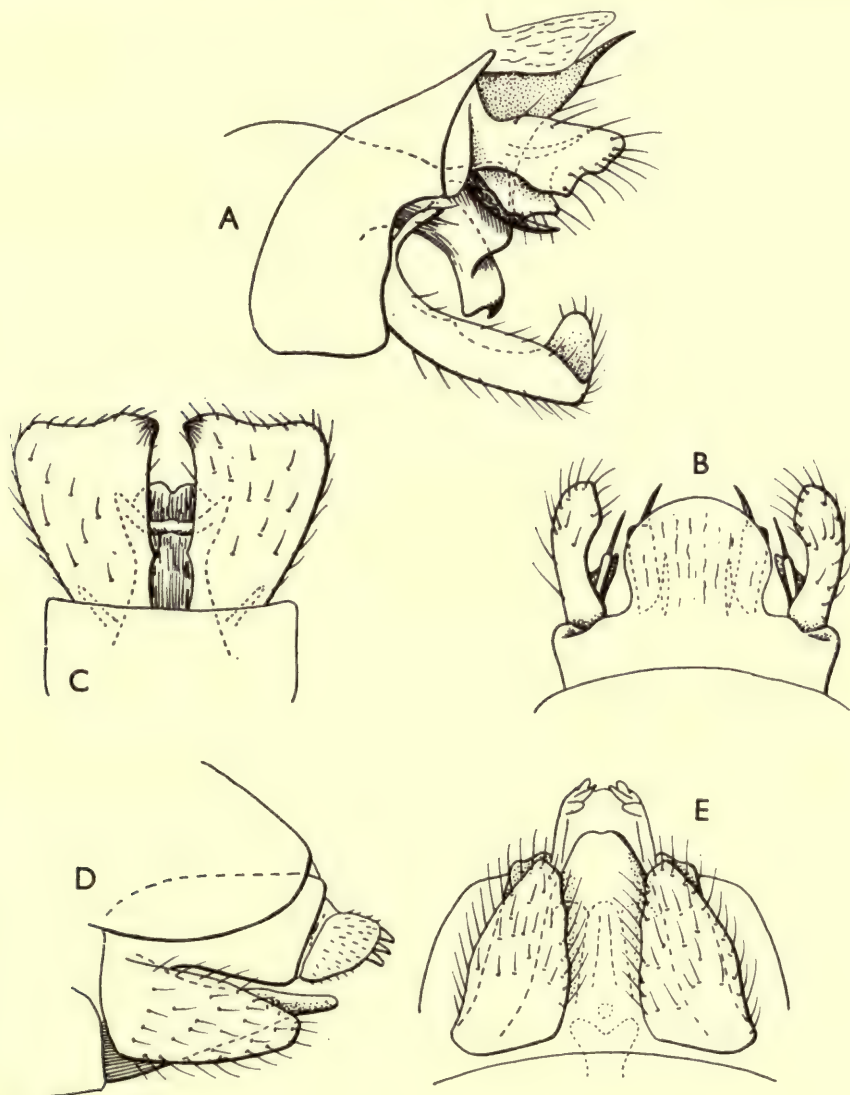


FIG. 30. *Polycentropus auricollis* sp. n. Genitalia. ♂, A-C, ♀, D-E. A, lateral; B, cerci, tenth segment and paraprocts, dorsal; C, claspers and aedeagus, ventral; D, lateral; E, ventral.

♂ GENITALIA. Ninth segment membranous above and merged with the tenth. The latter is lanceolate from the side and forms a rounded lobe from above, its base slightly constricted. Cercus a little longer than the tenth segment, in side view moderately broad, then constricted near base, upper margin beyond constriction straight, lower margin irregularly dilated. From above, cercus is slightly incurved and carries on its inner surface two processes, the upper slender, upcurved and digitate, terminating in a spine. The lower process forms a broad lobe, curved mesally and acute in dorsal view. Paraproctal process wide at base in side view, upper apical angle projecting in a single, slender spine, lower apical angle produced tailward in an acute claw. Aedeagus cylindrical, downcurved, with a pair of erect, quadrate lobes on its upper surface, apex of aedeagus terminating in a pair of divergent, downturned claws. Clasper long and slender in side view, inner apical angle curled upwards in a rounded lobe. From the base arises a slender, curved, digitate upper branch. In ventral view the clasper dilates from its base to a sinuously truncate apex, a small tooth on the inner margin in basal half.

♀ GENITALIA. Eighth sternite produced in a long, tapering subgenital plate with a slightly bilobed apex. Ninth segment partly enclosed within the eighth, lateral gonapophyses projecting beyond ninth segment, margins gently convex, apex narrow and truncate or bluntly rounded.

Length of fore wing, ♂, 5-6 mm., ♀, 5-7 mm.

♂ HOLOTYPE mounted as microscope preparations (vii. 1933), ♀ allotype pinned, with abdomen mounted in glycerine, paratypes pinned. Although similar in appearance to *P. piceus* sp. n. (apart from the yellow prothorax), this species differs markedly in both ♂ and ♀ genitalia. In the male, the cercus is more complex, bearing two branches or inner processes, the paraproctal process has both upper and lower branches, the aedeagus is more strongly developed and the clasper is quite different in form, the upper basal branch being represented by a slender finger. In the female, the lateral gonapophyses are narrower and truncate apically or bluntly rounded.

Polycentropus piceus sp. n.

(Text-figs. 25, 31)

PAPUA: Kokoda, 1,200 ft., x. 1933, 1 ♂, viii-ix, 1933, 1 ♀.

Head piceous, with fuscous hairs. Antennae stout, piceous, with reddish fuscous pubescence. Palpi fuscous. Thorax piceous, with fuscous hairs. Legs fuscous. Abdomen fuscous. Wings fuscous, with sparse reddish brown pubescence, immaculate apart from the whitish *r-m* cross-vein and base of median cell in fore wing and the *r-m* and *m-cu* cross-veins in hind wing.

♂ GENITALIA. Ninth segment membranous above and merged with the membranous tenth segment, which forms a paraboloid hood and bears on its ventral median line a row of stout setae. Cercus digitate from above, flattened and foliate from the side. Paraproctal hooks directed mesally and then outwards and upwards beneath the tenth segment. Aedeagus cylindrical, its apex from beneath slightly dilated. Clasper stout at base, in side view tapering gradually to a slender, incurved, hooked apex. Upper branch short, directed mesally in a blackened finger.

♀ GENITALIA. Eighth sternite forming a lightly sclerotized, spatulate subgenital plate, extending somewhat beyond the lateral gonapophyses. Ninth segment partly sunk within the eighth, lateral gonapophyses from the side with triangular apices, upper margin slightly concave.

From beneath, the apices are more rounded and between each plate and the ninth segment itself is a roughened pocket. Tenth segment small, with the usual three pairs of processes.

Length of fore wing, ♂, 6 mm., ♀, 6.5 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, abdomen in glycerine. This species differs from *P. rosselinus* Navás in the more triangular clasper in side view, the smaller upper basal branch, the smaller paraproctal hooks and narrower cerci, without a slender inner branch.

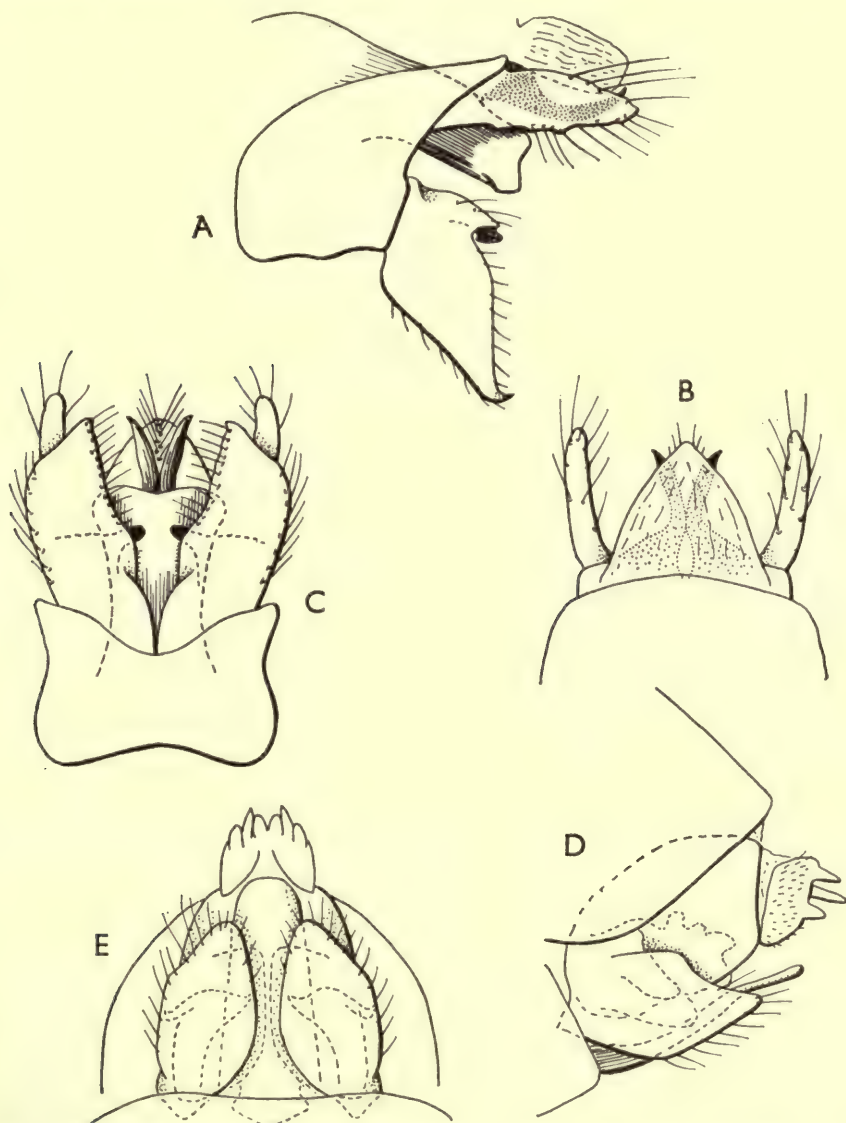


FIG. 31. *Polycentropus piceus* sp. n. Genitalia. ♂, A-C; ♀, D-E. A, lateral; B, cerci, tenth segment and paraprocts, dorsal; C, ventral; D, lateral; E, ventral.

Polycentropus rosselinus Navás

(Text-fig. 32)

I take the opportunity of figuring the male genitalia of a paratype of this species, from Rossel Isl., Mt. Rossel, 9,100 ft., xi-xii. 1915, W. F. Eichhorn.

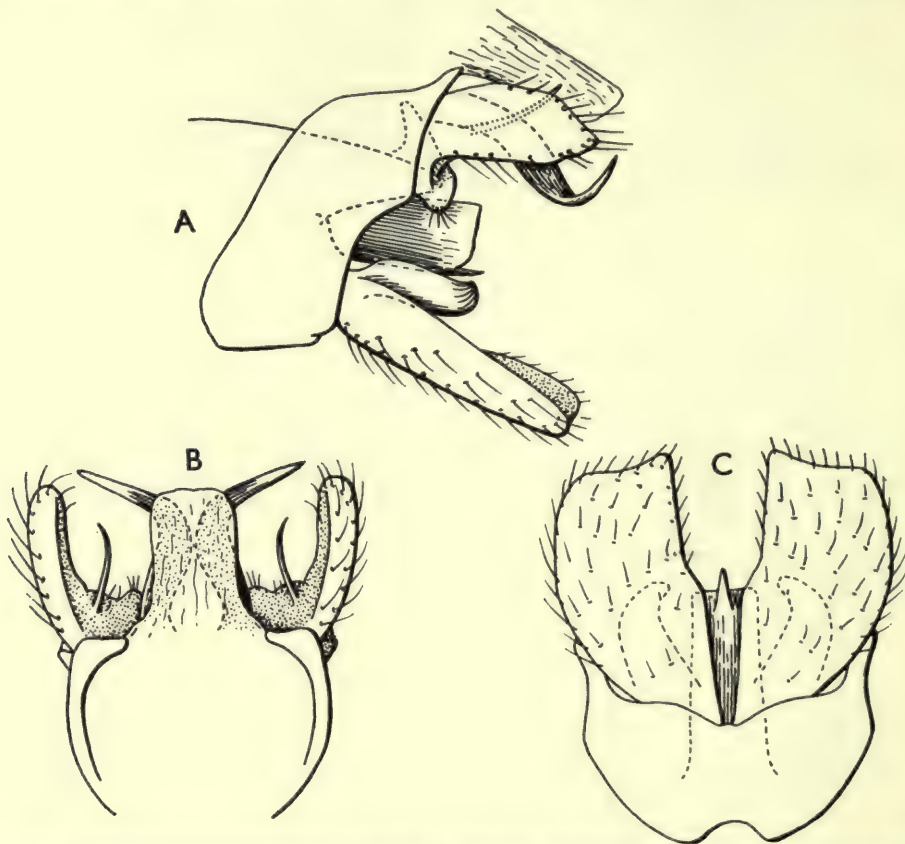


FIG. 32. *Polycentropus rosselinus* Navás, ♂ Paratype, genitalia. A, lateral; B, cerci, tenth segment and paraprocts, dorsal; C, claspers and aedeagus, ventral.

Polycentropus similis sp. n.

(Text-figs. 25, 33)

PAPUA: Kokoda, 1,200 ft., vi. 1933, 2 ♂.

Head dark fuscous, with dark brown hairs. Antennae fuscous, with fulvous annulations, more noticeable on the ventral side. Palpi fuscous. Thorax fuscous above, with brown hairs, paler on sides and beneath. Legs fulvous. Abdomen fuscous, terminalia fulvous. Fore wing densely clothed with dark reddish brown pubescence, membrane pale fuscous, with whitish areas around

the *r-m* cross-vein, the cross-vein closing the median cell, the base of the median cell and the *m-cu* cross-vein. Hind wing smoky hyaline, sparsely pubescent.

♂ GENITALIA. Tenth segment membranous, fused with the ninth and forming a short rounded hood. Paraproctal process stout, somewhat swollen shortly before apex, which is divided into two acute spines, one above the other and directed outwards. Cercus rather slender, digitate,

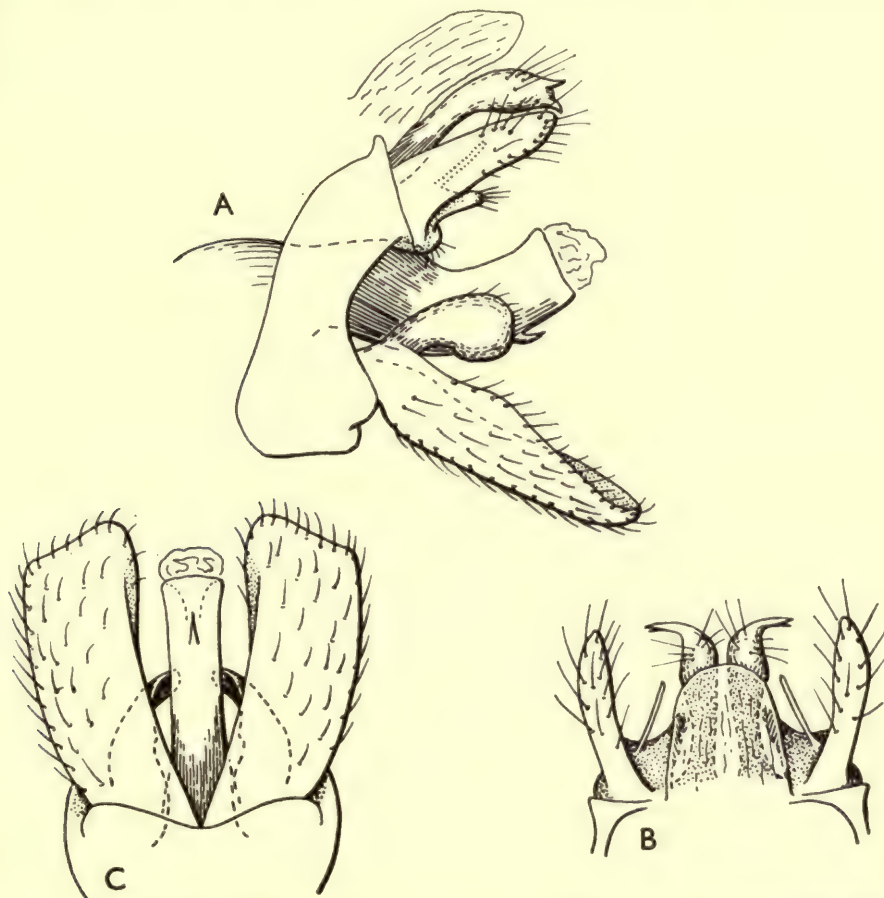


FIG. 33. *Polycentropus similis* sp. n. ♂ Genitalia. A, lateral; B, cerci, tenth segment and paraprocts, dorsal; C, claspers and aedeagus, ventral.

arising from a broader base and bearing on its inner surface two processes, one very slender, the other stouter and terminating in a tuft of bristles. Aedeagus cylindrical, with a short, acute tooth on ventral surface before apex, which bears some evertible membrane. Clasper elongate, rather narrower from the side than from beneath, in which aspect it is slightly incurved, parallel-sided, with an obliquely truncate apex. Upper basal branch stout, arched and clavate from the side, tapering and incurved from beneath, blackish.

Length of fore wing, ♂, 7-7.5 mm.

♂ HOLOTYPE mounted as microscope preparations, paratype pinned. This species is obviously closely related to *P. rosselinus* Navás and I at first considered it as a

variety of that species. Comparison with a paratype of that species has shown a number of differences in the male genitalia: the more dilated and bifid paraprocts, narrower cerci and narrower claspers with more strongly developed basal branches. In the aedeagus, the ventral tooth is situated pre-apically but this may be due to varying degrees of eversion of the membrane. The possibility cannot be ruled out that *rosselinus* or *similis* may prove to be synonymous with *P. australis* Ulmer. Figures of cleared examples do not agree with Ulmer's figures, but in pinned specimens the upper basal branch of the clasper may be obscured and the apex of the aedeagus appears as an open tube. Judging from the shape of the cercus, *rosselinus* is most like *australis*, but has not the two-spined paraprocts of *australis* and *similis*.

Family PSYCHOMYIIDAE

Tinodes aberrans sp. n.

(Text-fig. 34)

PAPUA: Kokoda, 1,200 ft., vi-ix. 1933, 2 ♂, 12 ♀.

General coloration blackish brown. A tuft of pale hairs between the bases of the antennae, the latter having pale annulations. The fore wing differs from the typical *Tinodes* venation in the absence of the cross-vein closing the median cell.

♂ GENITALIA. Ninth and tenth segments produced in a narrow hood with a membranous apex. Beneath it are a pair of slender paraprocts, fused at their bases. Aedeagus long and slender, with three spines or parameres; the most basal is on the ventral surface, the next (and longest) is lateral and the shortest is set on the dorsal surface. Apex of aedeagus curled downwards. Cerci very long and slender. Claspers fused basally, with a V-shaped excision between them, globose from the side and terminating in a short spine and two branches. One branch is digitate, hairy at its apex and the other is spiniform, bent inwards and then tailwards. Basal plate triangular, with a long, slender apodeme. Apically it projects in a long, tapering spine, its lower surface expanded downwards in a rounded keel. At the base of the plate, on its ventral side, is a pair of short, divergent fingers.

♀ GENITALIA. Eighth sternite emarginate at its centre. Ninth and tenth segments forming a long ovipositor.

Length of fore wing, ♂, 3.5 mm., ♀, 3-4 mm.

♂ HOLOTYPE (ix. 1933) mounted as microscope preparations, ♀ allotype pinned, with abdomen in glycerine, paratypes pinned. In structure of claspers this species shows some resemblance to *Tinodes igok* Kimmins (Sarawak), but the basal plate is more developed and the aedeagus and tenth segment differ considerably. It also agrees with *T. igok* and *T. silvicola* Kimmins (Sarawak) in the absence of the cross-vein closing the median cell in the fore wing. In the case of the two species from Sarawak, each was represented by a single example, but in the present species the cross-vein appears to be absent from all examples. Nevertheless, I do not think the erection of a new genus for these species to be justified, in view of the similarity of the male genitalia to those of other species of *Tinodes*.

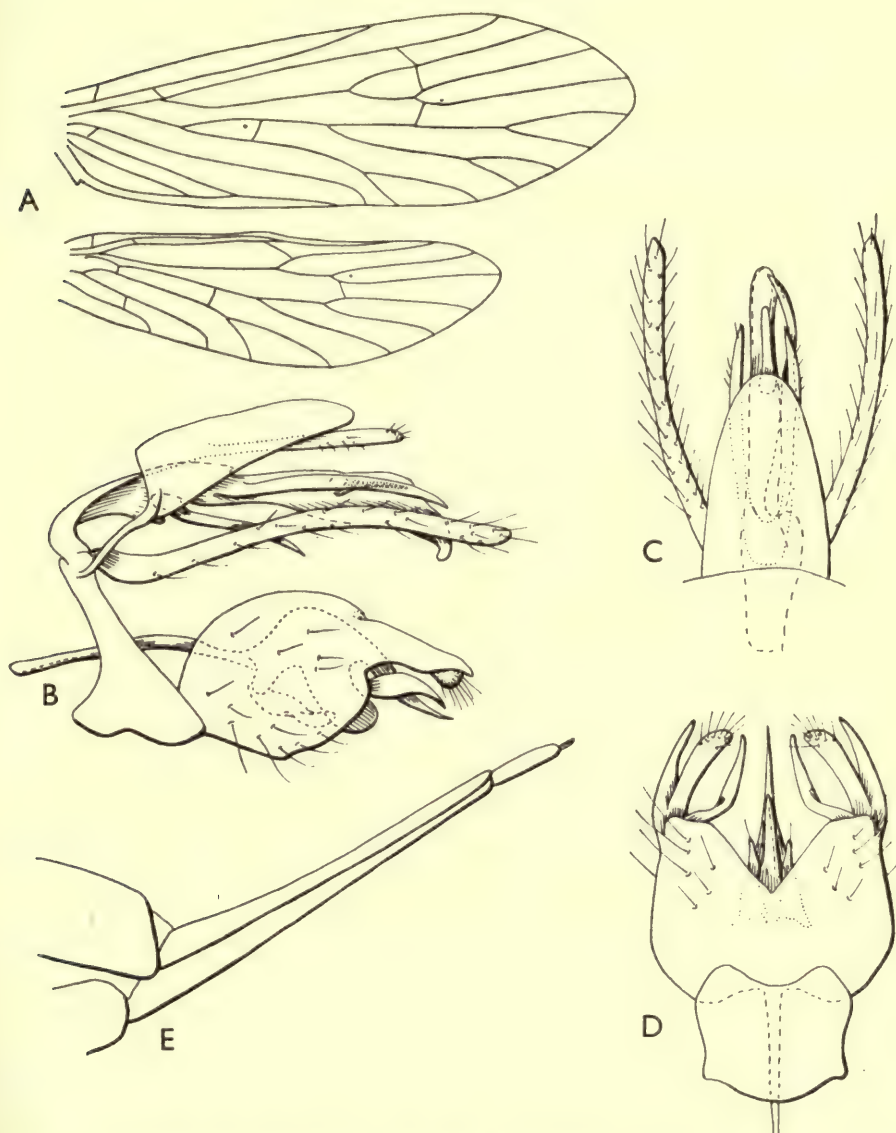


FIG. 34. *Tinodes aberrans* sp. n. A, ♂ wings; B, ♂ genitalia, lateral; C, ♂ ninth and tenth segments, paraprocts, cerci and aedeagus, dorsal; D, ♂ claspers, ventral; E, ♀ genitalia, lateral.

Ecnomus cyclopicus sp. n.

(Text-fig. 35)

DUTCH NEW GUINEA: Mt. Cyclops, 3,500 ft., iii. 1936, 1 ♂; Cyclops Mts., Sabron, Camp 2, 2,000 ft., vii. 1936, 1 ♂.

Spurs 3.4.4. Head tawny, with golden hairs; antennae luteous; palpi dark tawny. Thorax tawny, legs fulvous. Fore wing with sparse golden pubescence, membrane brownish, with hyaline spots.

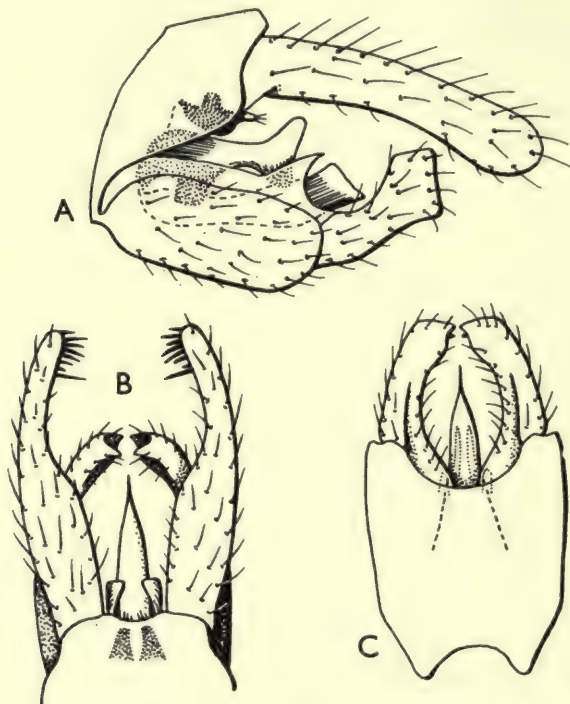


FIG. 35. *Ecnomus cyclopicus* sp. n. ♂ Genitalia. A, lateral; B, dorsal; C, claspers and aedeagus, ventral.

♂ GENITALIA. Cerci elongate, about three times as long as upper part of ninth segment, digitate and slightly downcurved in side view, from above slightly incurved, apical half about half as wide as basal and armed apically with stout, black teeth. Paraproctal processes short, digitate, with an apical tuft of bristles. Parameres about two-thirds as long as aedeagus, clavate apically in side view, tapering to a thin plate in dorsal. Clasper shorter than lower half of ninth segment, in side view with a deep rounded excision of upper margin, apex truncate, upper and lower angles produced inwards in acute teeth.

Length of fore wing, ♂, 5 mm.

♂ HOLOTYPE (iii. 1936) mounted as microscope preparations, paratype pinned, abdomen in glycerine. This species resembles *E. papuanus* Ulmer in the long, digitate cerci, but the claspers are quite differently formed.

Family **HYDROPSYCHIDAE**Subfamily **OESTROPSINAE***Oestropsyche vitrina* (Hagen)

PAPUA : Kokoda, 1,200 ft., v, vii-ix. 1933, 1 ♂, 31 ♀.

Previously recorded from Ceylon, Java, Sumatra, Borneo, Celebes, China, Philippines and New Guinea.

Macronema saundersi McLachlan

PAPUA : Kokoda, 1,200 ft., vii, x. 1933, 4 ♂.

Previously recorded from Mysol Island, New Guinea.

Macronema lorlai Navás, 1930 (*nec* 1933)

PAPUA : Kokoda, 1,200 ft., v-viii. 1933, 16 ♂, 3 ♀.

DUTCH NEW GUINEA : Lake Sentani, Ifar, viii. 1936, 1 ♂, 4 ?, all determined by M. E. Mosely.

Previously recorded from New Guinea.

Subfamily **HYDROPSYCHINAE***Hydropsyche moselyi* sp. n.

(Text-fig. 36)

Hydropsyche hobbyi Mosely, 1931, *Ann. Mag. nat. Hist.* (12) 4 : 484-487 (*partim*, Papuan examples) *nec* figs. 9-12.

PAPUA : Kokoda, 1,200 ft., iv-v, vii-x. 1933, 3 ♂, numerous females.

Head fulvous, with golden pubescence. Antennae fulvous basally, with fuscous annulations, becoming progressively more fuscous towards the apices. Palpi fulvous. Thorax and legs fulvous, with golden hairs and pubescence. Abdomen brownish. Fore wing with brownish and golden pubescence, the latter forming numerous small irrorations.

♂ GENITALIA. Ninth tergite moderately elevated at its centre. Side-pieces tapering to bluntly rounded apices. Tenth segment long and narrow from the side, apex with a pair of short, downcurved fingers. From above, it is moderately broad, with a rounded excision between the apical fingers, which are also incurved. Aedeagus trifid at its apex, the centre branch being an upcurved spine, longer than the side branches. The latter curve upwards and outwards and terminate in bifid apices. From the upper surface of the aedeagus, just basad of the three branches, two pairs of membranous processes arise from a common base. One pair is directed apically and terminates in a bunch of spines, the other pair directed basally along the stem of the aedeagus, ending in bifid claws. Clasper elongate, slender, basal segment more than three times as long as the rather sinuous terminal segment.

♀ GENITALIA. No reticulate patches on pleurites of abdominal segments. Lateral lobe of eighth sternite tapering to a rounded apex. Clasper receptacle of ninth tergite small, its opening further

restricted by a median ridge running into the receptacle. Lateral lobe of ninth segment short and deep. Lower angle of tenth segment rectangular.

Length of fore wing, ♂, 7.5–8 mm., ♀, 7–9 mm.

♂ HOLOTYPE and ♀ allotype pinned, both with abdomens cleared and in glycerine, paratypes pinned. This species is closely related to *Hydropsyche hobbyi* Mosely, but I

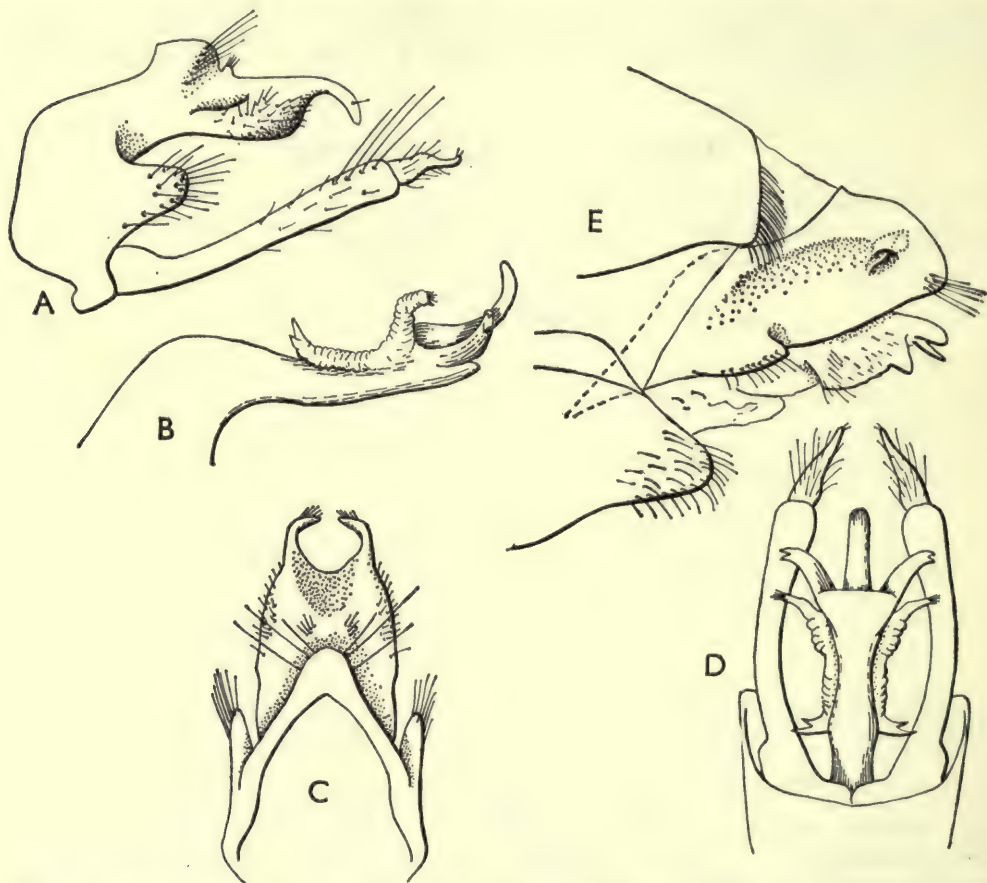


FIG. 36. *Hydropsyche moselyi* sp. n. Genitalia. A, ♂, lateral; B, ♂, aedeagus, lateral; C, ♂, ninth and tenth segments, dorsal; D, ♂, claspers and aedeagus, ventral; E, ♀ lateral.

feel sure that had Mosely made a preparation of a Papuan male, he would not have considered it conspecific. In the male, the apical processes of the tenth segment are shorter and more abruptly turned down. The outer apical branches of the aedeagus are out-turned and bifid and the pre-apical armature is different, consisting of two (not three) pairs of processes. The nine females from Dutch New Guinea, Sabron, referred to by Mosely are rather larger and show slight differences in terminalia. I think it better to consider them as an unidentified species of *Hydropsyche*.

***Herbertorossia excavata* sp. n.**

(Text-fig. 37)

PAPUA : Kokoda, 1,200 ft., iv-ix. 1933, 18 ♂, numerous females.

Head pale fulvous, with golden pubescence. Maxillary palp pale fulvous, fifth segment a little shorter than the third and fourth together. Antennae slender, pale fulvous, faintly annulated with fuscous. Thorax pale fuscous, with golden pubescence. Legs fulvous, anterior tarsus of male with outer claw very much enlarged. Abdomen fuscous. Fore wing clothed with short golden pubescence and with numerous spots of paler pubescence. These small spots have their hyaline counterparts in the yellowish brown wing membrane.

♂ GENITALIA. Dorsal margin of ninth segment produced in a triangle, with a narrowly excised apex. Tenth segment from the side deep, its upper margin deeply excised, upper and lower apical angles rounded and setose. From above, the tenth segment is short and broad, the upper and lower apical angles appearing as rounded lobes, the upper ones separated by a small excision. Aedeagus constricted before its apex, which carries two pairs of lobes, the outer ones large and enclosing the inner. Clasper moderately long, basal segment only slightly longer than the tenth segment. Terminal segment rather less than half the length of the basal, narrowed and incurved, its apex slightly dilated and carrying a number of short teeth.

♀ GENITALIA. Pleural membranes of segments four and five with reticulated areas above the spiracles, that on the fourth the larger and quadrate, the fifth circular. The lower apical angle of eighth tergite hooked downward. Clasper receptacle of ninth tergite moderately long, with a wide mouth, tapering to a rounded apex. Clasper groove broad and indefinite. Lateral lobe of ninth tergite lightly sclerotized, rounded. Lower angle of tenth tergite rounded.

Length of fore wing, ♂, 7-9 mm., ♀ 8-10 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, with abdomen cleared and in glycerine, paratypes pinned. This species differs from *H. unguolata* (Ulmer) in the relatively shorter and stouter claspers and the shorter tenth segment, which is broader apically and has a deeply excavate dorsal margin in side view.

***Herbertorossia sabronensis* sp. n.**

(Text-fig. 38)

DUTCH NEW GUINEA : Cyclops Mts., Sabron, 930 ft., iv-vi. 1936, 3 ♂, 5 ♀ ; Sabron, Camp 1, 1,200 ft., 15-22. v. 1936, 3 ♀ ; Camp 2, 2,000 ft., vii. 1936, 6 ♂, 2 ♀.

General appearance much as in *H. excavata* sp. n.

♂ GENITALIA. Similar in pattern to *H. excavata* sp. n., but differing in detail. The excavation of the dorsal margin of the tenth segment is rather narrower and the tenth segment itself in side view is more slender, the upper apical angle smaller and more rounded. Lower apical angles less pronounced. From above, the produced part of the ninth segment is more acute, not bifid, and the lateral hollows deeper ; the tenth segment tapers to a narrower apex. Aedeagus less constricted before the apex, terminal lobes obliquely truncate in side view instead of rounded. In ventral view these lobes are triangular rather than reniform. Clasper more slender, basal segment three times as long as terminal.

♀ GENITALIA. Pleurites of the fourth to sixth segments with elongate-oval reticulated areas, that on the fifth being the largest and the sixth the smallest. Lip of the clasper receptacle produced in a small lobe at its centre. Clasper groove shallow. Lateral lobe of ninth tergite rounded. Tenth segment short and deep, lower angle produced in a rounded lobe.

Length of fore wing, ♂, 8.5 mm., ♀, 9 mm.

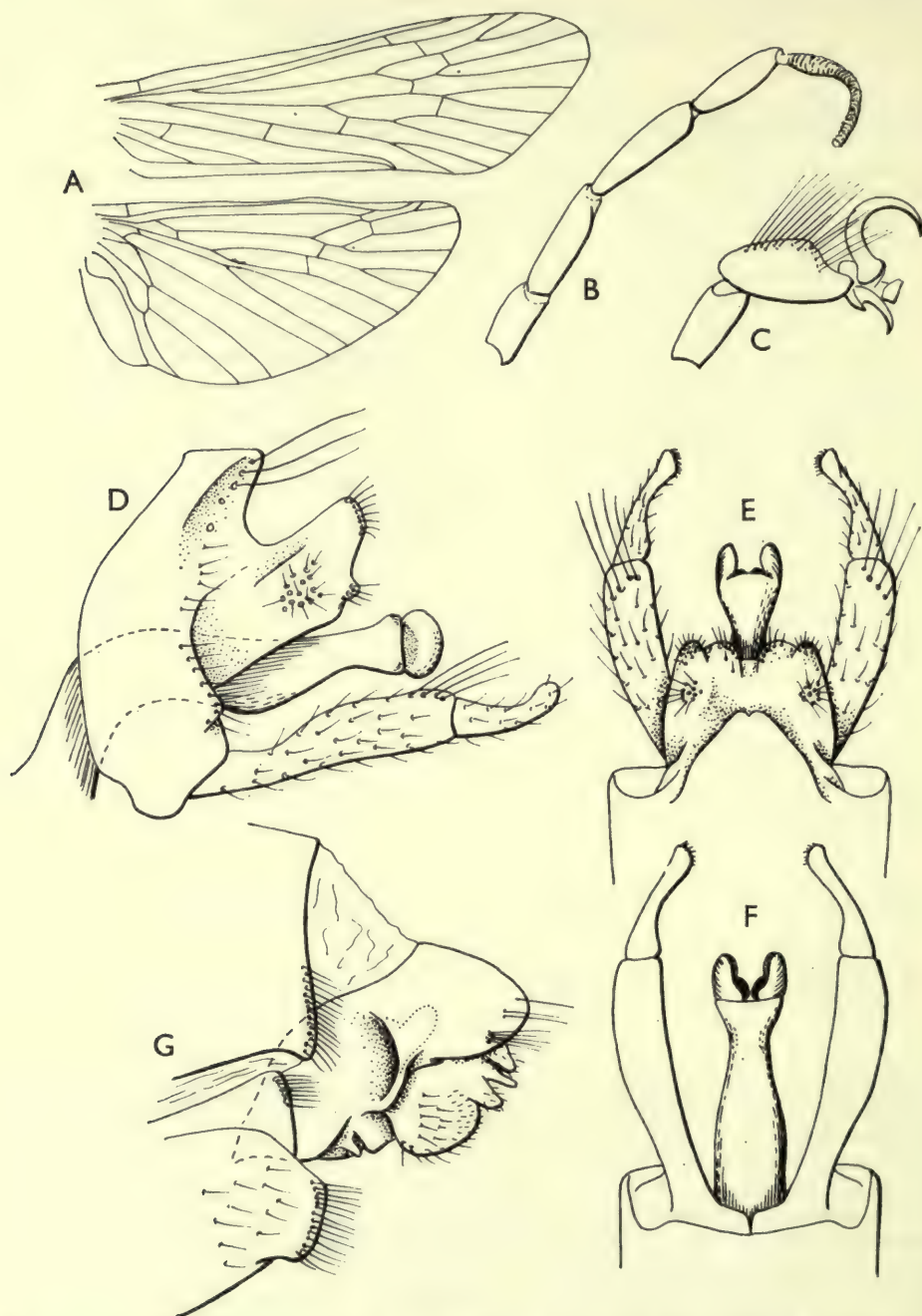


FIG. 37. *Herbertorossia excavata* sp. n. A, wings ; B, ♂, apex of fore tarsus ; C, maxillary palpus ; D-G, genitalia ; D, ♂, lateral ; E, ♂, dorsal ; F, ♂, claspers and aedeagus, ventral ; G, ♀, lateral.

♂ HOLOTYPE and ♀ allotype (Sabron, 930 ft.) pinned, abdomens cleared and in glycerine, paratypes pinned. This species is closely related to *H. excavata* sp. n., and the differences in male genitalia are noted above. The difference in the shape of the

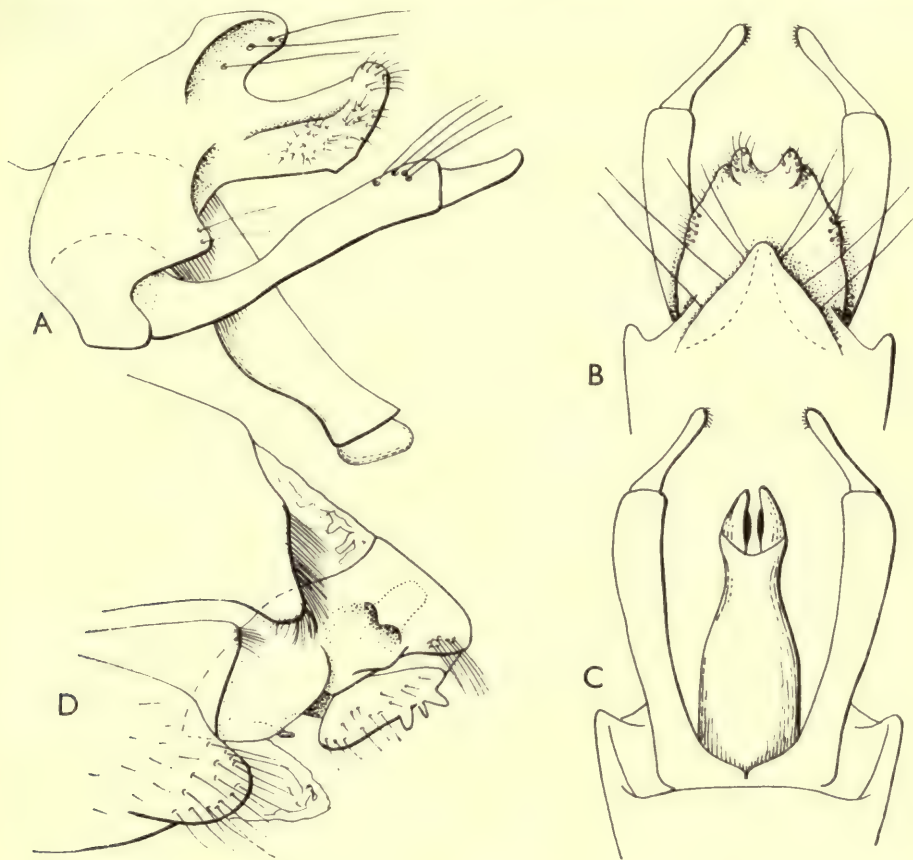


FIG. 38. *Herbertorossia sabronensis* sp. n. Genitalia. A, ♂, lateral; B, ♂, dorsal; C, ♂, claspers and aedeagus, ventral; D, ♀, lateral.

tenth segment can generally be made out in the pinned examples, although it is of course more evident in a cleared preparation. The females may be distinguished by the shape of the eighth tergite, the clasper receptacle and the tenth tergite.

Herbertorossia striata sp. n.

(Text-fig. 39)

PAPUA: Kokoda, 1,200 ft., v. 1933, 1 ♂; Mondo, 5,000 ft., i-ii. 1934, 1 ♂.

Head fulvous, with golden pubescence. Antennae luteous, with faint brownish annulations. Palpi fulvous. Thorax fulvous, with golden pubescence. Legs and abdomen fulvous. Enlarged

claw of fore tarsus of male almost straight. Fore wing with numerous spots of pale golden pubescence on a brown ground, the base, costal and anal margins being largely pale golden. The brown pubescence forms a distinctive, slightly angled streak running along the first anal vein as far as the junction with the second anal vein, then bending obliquely forward to the posterior margin of the median cell, finally bending again to run through fork Cu_{1a} to the wing margin. Hind wing hyaline, with sparse golden pubescence. Venation of fore wing differing from that of

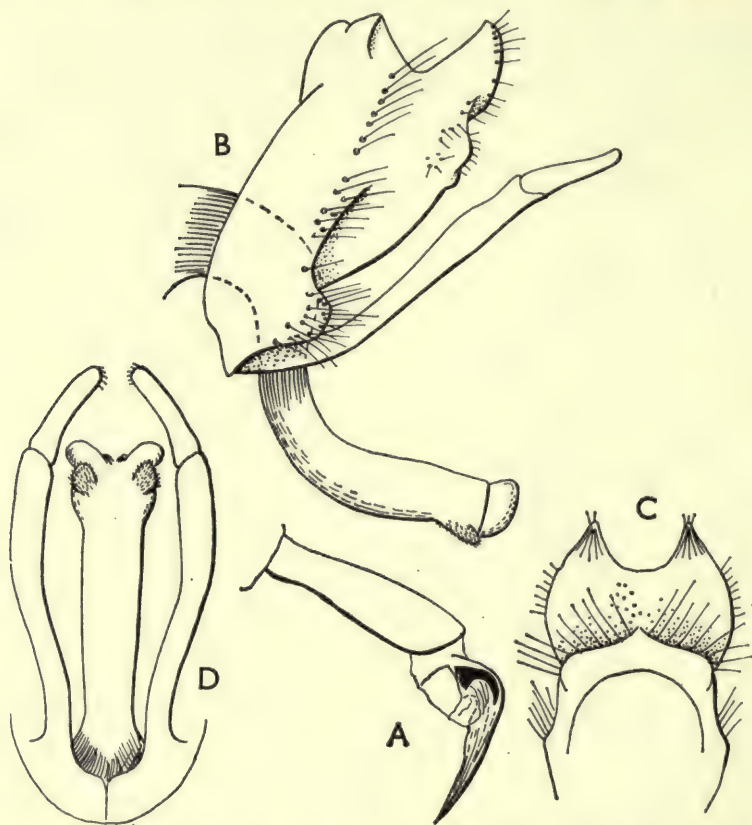


FIG. 39. *Herbertorossia striata* sp. n. ♂. A, fore tarsal claws; B, genitalia, lateral; C, ninth and tenth segments, dorsal; D, claspers and aedeagus, ventral.

H. excavata. Median cell short, about as long as discoidal. Fork R_2 with a short footstalk, fork M_1 about twice as long as its footstalk. In hind wing, discoidal cell rather short, median cell as in *excavata*.

♂ GENITALIA. Ninth segment short, apical margin only slightly produced in a shallow triangle. Tenth segment deep but short, margin forming a slightly sinuous convexity, upper angle pointed. From above, the upper angles are separated by a semicircular excision. Aedeagus long and slender, from the side sinuous, curving first downwards and then tailward. Apex slightly dilated in ventral view, with a pair of ventral setose lobes. Apical lobes convex, slightly longer above than below. Clasper long and slender, basal segment fully three times as long as terminal.

Length of fore wing, ♂, 8–10 mm.

♂ HOLOTYPE (Kokoda) pinned, with abdomen and fore leg in glycerine, ♂ paratype pinned. In the proportions of the clasper, this species approaches *H. unguolata* Ulmer, but differs from it and from the other described species in the almost straight enlarged tarsal claw of the ♂ fore leg, the sinuous aedeagus, the form of the tenth segment and the angled band of brown pubescence on the fore wing, from which the specific name is derived.

***Herbertorossia orakaivai* sp. n.**

(Text-fig. 40)

PAPUA: Kokoda, 1,200 ft., v, vii, ix-x. 1933, 11 ♂, 10 ♀.

General appearance much as in *H. excavata* sp. n., but rather smaller, and with smaller and more numerous pale golden irrorations on the fore wing. Venation much as in that species, but fork M_1 in the fore wing with a slightly longer footstalk. Enlarged fore tarsal claw of ♂ as in *excavata*.

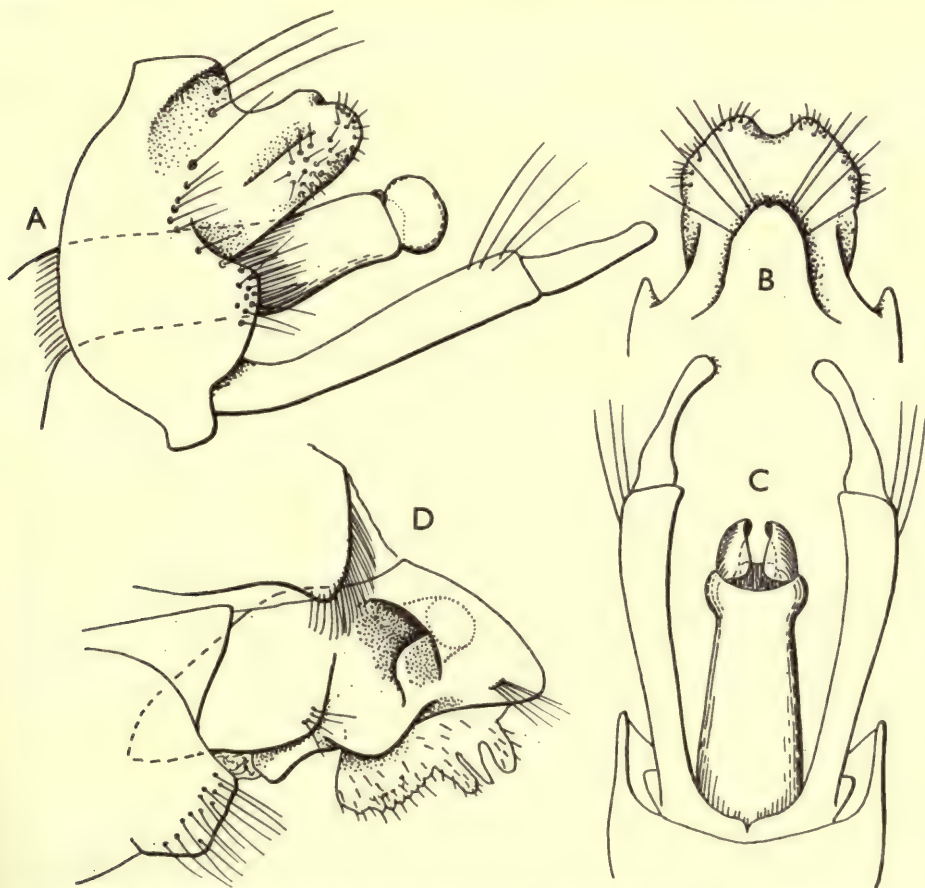


FIG. 40. *Herbertorossia orakaivai* sp. n. Genitalia. A, ♂, lateral; B, ♂, ninth and tenth segments, dorsal; C, ♂, claspers and aedeagus, ventral; D, ♀, lateral.

♂ GENITALIA. Similar in pattern to *H. excavata*. The dorsal excavation of the tenth segment in side view is shallow and the tenth segment is rounded apically without produced lower angle. Apical margin bilobed, with a rounded median excision. Aedeagus scarcely constricted before the apex, apical lobes ovate, much as in *excavata*. From beneath, the apex is somewhat clavate. Clasper with the basal segment about two and a half times as long as the terminal.

♀ GENITALIA. Pleurites of the fourth and fifth segments with reticulated areas. Clasper receptacle of ninth segment wider than in *excavata* and with a median ridge in the opening. The lobe below the opening of the receptacle more strongly developed, as is the lateral lobe. Lower part of tenth segment elongate, the hairs arising from elevated bases.

Length of fore wing, ♂, 6-7 mm., ♀, 7-8 mm.

♂ HOLOTYPE (v.33) and ♀ allotype (ix.33) pinned, abdomens cleared and in glycerine, paratypes pinned. The differences between this species and *H. excavata* are set out in the foregoing description. The specific name is derived from the Orakaiva tribe, which inhabits the plains around Kokoda.

Hydropsychodes expeditionis Ulmer

PAPUA: Kokoda, 1,200 ft., v-x. 1933, 22 ♂, 39 ♀.

Previously recorded from Papua.

Hydropsychodes cheesmanae sp. n.

(Text-fig. 41)

PAPUA: Kokoda, 1,200 ft., vii-ix. 1933, 7 ♂, 2 ♀.

Head fuscous, with golden pubescence above, that on the clypeus brownish. Palpi fuscous, with brownish pubescence. Antennae fuscous, towards the bases annulated with fulvous. Thorax fuscous, with golden pubescence. Legs fulvous, with golden pubescence. Abdomen fuscous, terminalia fulvous. Fore wing densely pubescent, brownish, with numerous golden spots. Hind wing with pale smoky membrane, sparsely pubescent.

♂ GENITALIA. Centre of margin of ninth segment elevated in a transverse ridge, fringed with long setae. Side-pieces rounded. Tenth segment forming a quadrate hood, shallowly trilobed apically in dorsal view, centre lobe triangular, elevated above the lateral lobes. A setiferous wart on each side towards apex. Aedeagus clavate apically, with large, convex, apical lobes. Clasper with long basal segment, terminal segment incurved, its inner surface somewhat hollowed.

♀ GENITALIA. Pleurite of fourth abdominal segment with a large reticulated area. Clasper receptacle guarded by a long flange or groove, opening small and ovate. Lateral lobe of ninth segment rudimentary. Tenth segment short and deep, lower angle rounded.

Length of fore wing, ♂, 7-7.5 mm., ♀, 6 mm.

♂ HOLOTYPE mounted as a microscope preparation, ♀ allotype pinned, with abdomens in glycerine, paratypes pinned. This species differs from *H. expeditionis* in its greater size, darker colour, shape of the tenth tergite and the relatively shorter, stouter terminal segment of the clasper. The two females are associated somewhat doubtfully with the males owing to their smaller size.

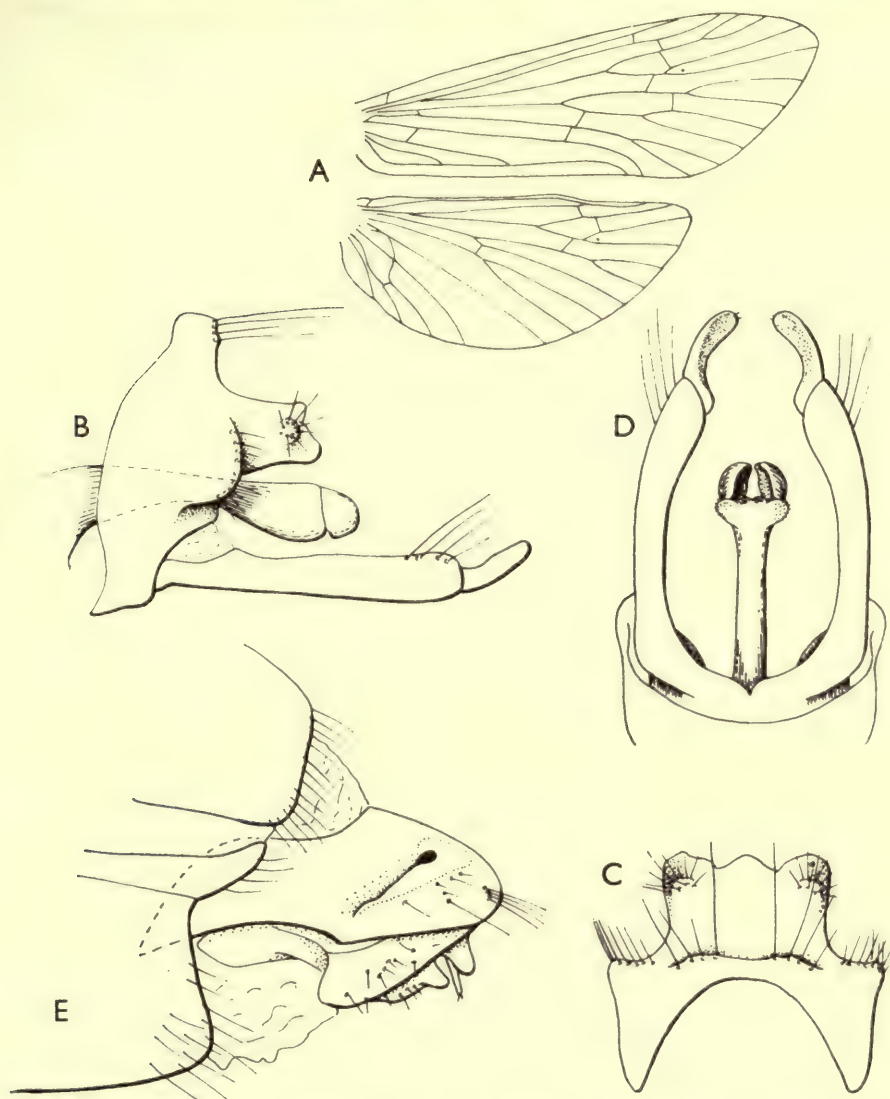


FIG. 41. *Hydropsychodes cheesmanae* sp. n. A, ♂ wings; B, ♂, genitalia, lateral; C, ♂, ninth and tenth segments, dorsal; D, ♂, claspers and aedeagus, ventral; E, ♀ genitalia, lateral.

***Abacaria subfusca* sp. n.**

(Text-fig. 42)

PAPUA: Kokoda, 1,200 ft., viii-ix. 1933, 3 ♂, 7 ♀.

Coloration pale fuscous, with golden hairs and pubescence. Fore wing membrane pale fuscous, with sparse (? denuded), uniform golden pubescence.

♂ GENITALIA. Ninth segment somewhat elevated in a dorsal triangle, whose apex is slightly excised. Side-pieces triangular, rather thick in dorsal aspect. Tenth segment short and deep, truncate apically in side view, upper apical angles each with a globular, hairy process, lower

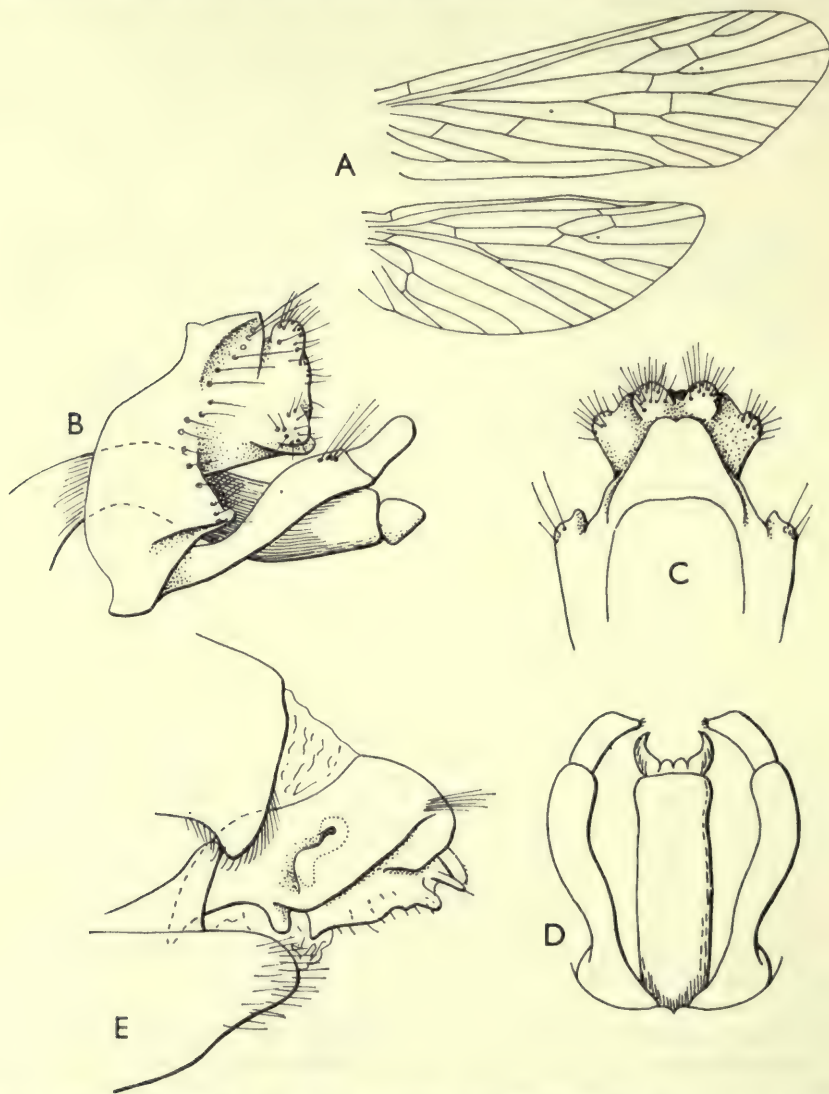


FIG. 42. *Abacaria subfusca* sp. n. A, ♂ wings; B, ♂, genitalia, lateral; C, ♂, ninth and tenth segments, dorsal; D, ♂, claspers and aedeagus, ventral; E, ♀ genitalia, lateral.

apical angles produced outward in rounded, hairy lobes. Aedeagus cylindrical, sinuous in side view, slightly constricted before the apex in dorsal view, apical lobes triangular in side view, falcate dorsally. Clasper rather short, basal segment sinuous, slightly clavate apically, arising from a wide base in ventral aspect. Terminal segment short and incurved, tapering near apex to a short, setose finger.

♀ GENITALIA. Eighth tergite with apical margin widely excised in a V, lower apical angles produced downwards in lateral aspect. Pleurosternum of eighth segment strongly produced upwards in a triangle with rounded apex. Lobes of eighth sternite produced, with rounded apices, separated by a deep median excision. Clasper receptacle of ninth tergite moderately large, clasper groove largely covered by a sinuate flange on apical side. Lateral lobe of ninth tergite small, spatulate. Lower angle of tenth tergite acute. Inner margins of upper pair of apical processes more sclerotized.

Length of fore wing, ♂, 5 mm., ♀, 5-6 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, abdomen in glycerine, paratypes pinned. This species has been placed in the genus *Abacaria* (hitherto recorded only from Fiji) on the wing venation and general pattern of male genitalia. The venation of *Abacaria* differs from that of *Hydropsychodes* in having the *m-cu* and *cu* cross-veins in the fore wing widely distant from one another, and *M* and *Cu*₁ in hind wing running close together as far as the fork of *Cu*₁. In these characters it resembles *Hydropsyche*, from which it differs in the absence of fork *R*₂ in the hind wing. From *A. fijiana* and *A. ruficeps*, the male may be distinguished by the more truncate tenth segment and different apical lobes of the aedeagus, and by its smaller size and unmarked wings in both sexes.

Abacaria sp.

PAPUA: Kokoda, 1,200 ft., v, viii-ix. 1933, 3 ♀.

These three specimens are not referred to *A. subfusca* on account of their much greater size (fore wing 8-9 mm.), although in general appearance they are similar.

Subfamily DIPLECTRONINAE

Diplectrona mafulua sp. n.

(Text-fig. 43)

PAPUA: Mafulu, 4,000 ft., i. 1934, 1 ♂.

Head luteous, with golden hairs. Eyes rather large, inter-ocular distance about equal to radius of eye in dorsal view. Antennae defective, luteous, becoming more brownish towards apices. Palpi luteous. Thorax and abdomen fulvous. Legs luteous. Fore wing membrane hyaline, sparsely pubescent, mainly golden but faintly brownish along anal margin and with a faint band crossing the centre of the wing from arculus to the pterostigma. Hind wing hyaline.

♂ GENITALIA. Lateral filaments of fifth segment only as long as segment. No internal reticulated bodies but in the base of the eighth pleurite there is a small, spherical pocket, the membranous walls of which exhibit transverse wrinkles. Dorsal surface of ninth segment divided longitudinally by a narrow membranous area. Side-pieces scarcely developed. Tenth segment in side view somewhat triangular, upper margin convex. Near the lower basal angle is an oblique flange, fringed with hairs. From above, the apical margin is widely excised, with a small notch marking off the outer apical angle, which is spatulate. Aedeagus short, with a heavily clubbed apex, from which arises two pairs of processes. Clasper slender, basal segment much longer than apical.

Length of fore wing, ♂, 6 mm.

♂ HOLOTYPE mounted as microscope preparations. This species resembles *D. dulitensis* Kimmins (Sarawak) in possessing a single pair of pockets at the base of the

eighth pleurite. In *dulitensis* the pocket is narrower and less spherical than in *mafulua*. In the original description of *dulitensis*, this pocket was described as reticulated, but on

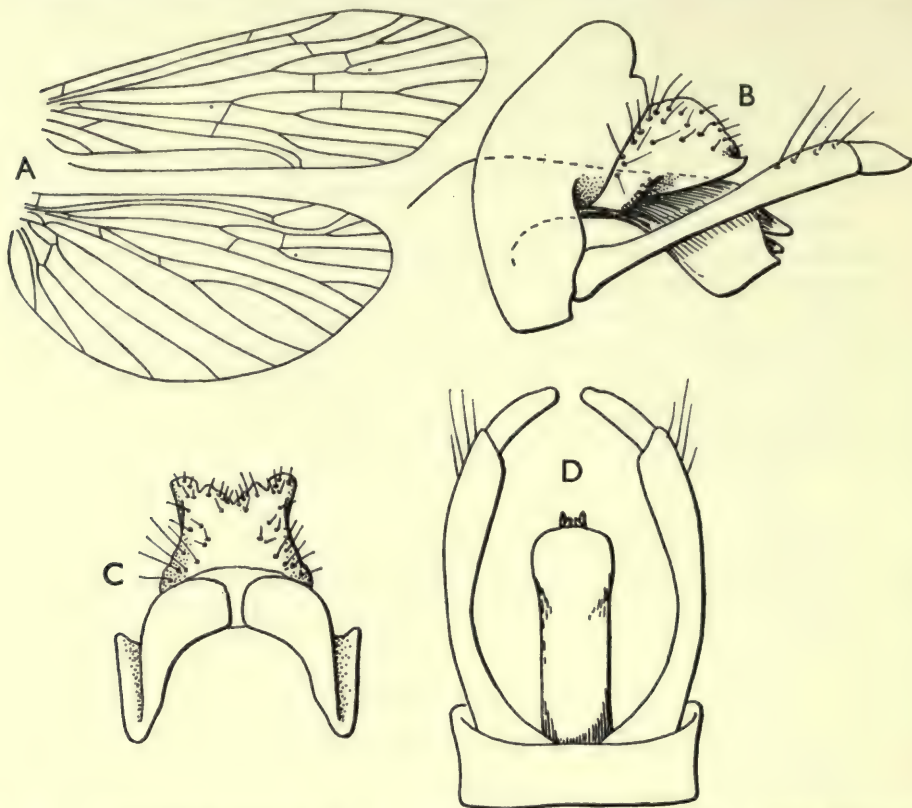


FIG. 43. *Diptlectrona mafulua* sp. n. ♂ A, wings; B, genitalia, lateral; C, ninth and tenth segments, dorsal; D, claspers and aedeagus, ventral.

re-examination I consider that ridged or wrinkled would be a more accurate description. In genitalia, although following the same general pattern, the detailed construction is quite distinct.

Family CALAMOCERATIDAE

Subfamily ANISOCENTROPODINAE

Anisocentropus io sp. n.

(Text-figs. 44-45)

DUTCH NEW GUINEA: Cyclops Mts., Sabron, 930 ft., v-vi. 1936, 2 ♂.

Head fulvous, with golden pubescence, vertex shining. Antennae fulvous at base, with narrow, whitish, apical annulations. These annulations become progressively larger towards midway,

then decrease towards apex of antenna. Palpi with fulvous and piceous pubescence. Thorax fulvous, with golden pubescence. Fore wing densely pubescent, with a striking oculate spot in basal half of wing. The pubescence is dark brown, pale brown and cream, and there are also areas of iridescent, scale-like hairs, pale blue in the apical half of the wing and a more lilac-blue in the basal half. The pattern of the wing is shown diagrammatically in Text-fig. 44. This

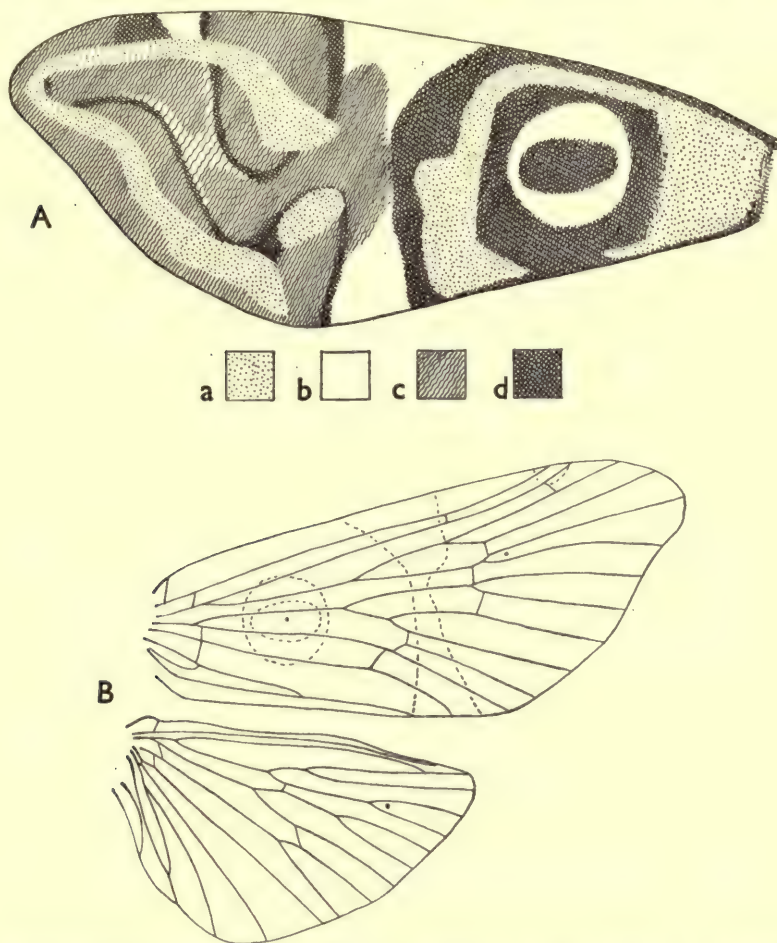


FIG. 44. *Anisocentropus io* sp. n. Wings. A, pattern of fore wing; B, ♂ wings. (a = iridescent blues, b = cream, c = pale brown, d = dark brown.)

diagram was drawn from an unmounted wing and the base therefore appears slightly narrower than in the wing venation figure, which was taken from a prepared and flattened wing. The cream areas have their hyaline counterpart in the brownish membrane of the wing. Apex slightly falcate. Abdomen brownish.

♂ GENITALIA. Ninth segment with short, truncate side-pieces, ventral apical margin widely excised at its centre. Tenth segment fused to ninth, forming a large, transverse hood, deep from the side, apical angles hooked downwards, a small excision at centre of apical margin. Cercus short and digitate. Aedeagus short and cylindrical. Clasper single-segmented, short,

triangular in side view. From beneath, it is divergent, inner margin dilated, armed with short spines. Apex of clasper slender and digitate.

Length of fore wing, ♂, 10 mm.

♂ HOLOTYPE mounted as microscope preparations, paratype pinned. In venation of fore wing this species is related to *A. triangulatus* Ulmer, especially in the origin of fork M_3 , which arises before the middle of the median cell. Both species show a sinuously falcate apex. The hind wing of *A. io* sp.n. is much wider (possibly a sexual

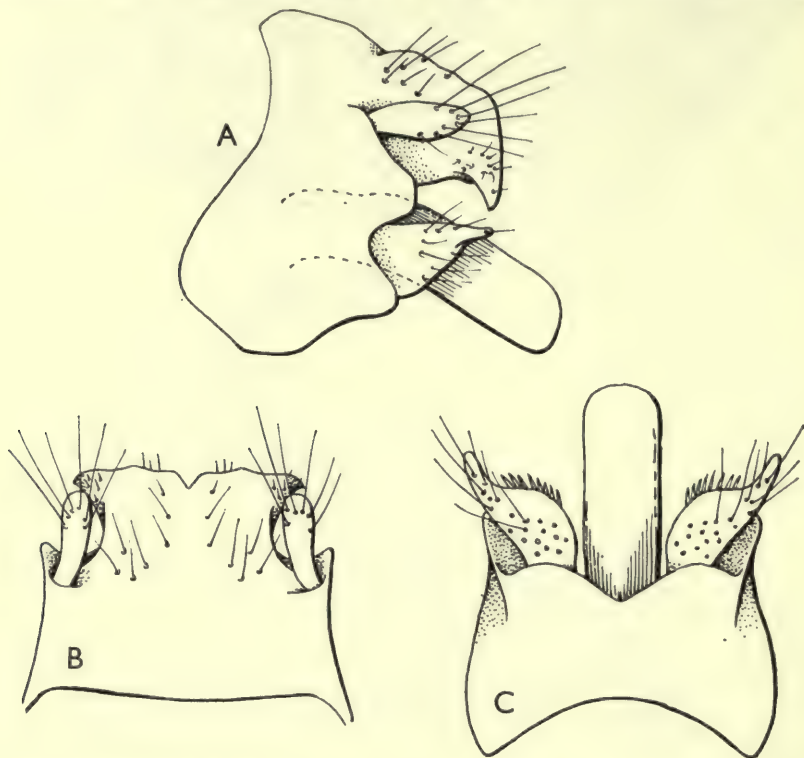


FIG. 45. *Anisocentropus io* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth segments, dorsal; C, claspers and aedeagus, ventral.

character) but the venation resembles that of *A. triangulatus* Ulmer. It differs in the striking cream-coloured eye-spot, with its dark brown pupil in the basal half of the fore wing.

Anisocentropus triangulatus Ulmer

PAPUA: Kokoda, 1,200 ft., ix. 1933, 1 ♀, det. M. E. Mosely.

This female differs from Ulmer's figure in having the apical pale triangle of the fore wing much smaller, more as in *A. io* sp. n. There is however no trace of the eye-spot of that species, either in vestiture or in membrane pattern.

Previously recorded from Fergusson Island.

Anisocentropus sp.

DUTCH NEW GUINEA : Cyclops Mts., Sabron, 930 ft., v-vi. 1936, 1 ♂ ; Mt. Cyclops, 3,500 ft., iii. 1936, 1 ♂.

These two males, of a fairly uniform testaceous colouring, differ from one another slightly in size and wing shape. One is rather denuded, the other has a fine, transverse,

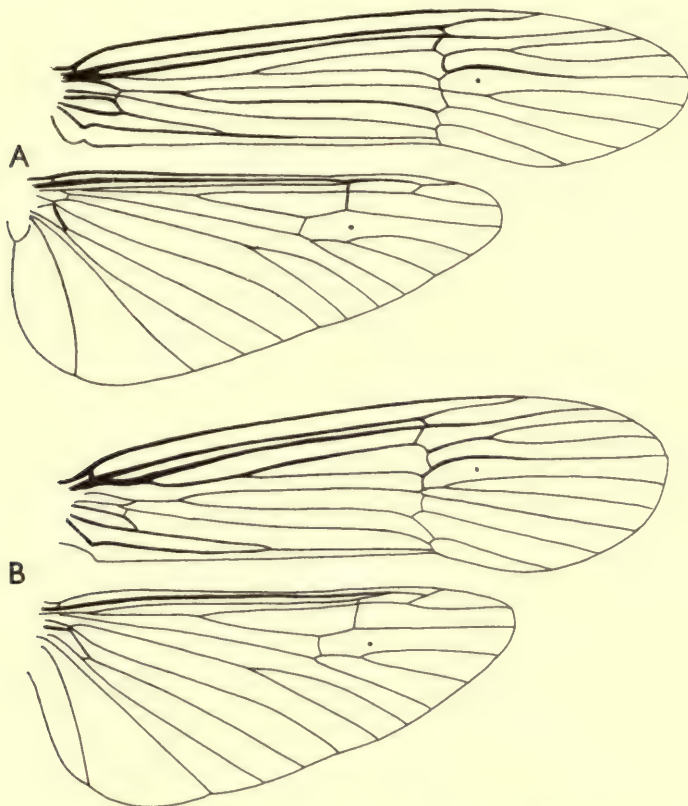


FIG. 46. *Notanatolica gilolensis* McLachlan. Wings of A, ♂ from Kokoda ; B, ♀ type, Halmaheira.

pale line across the fore wing just before the arculus. They also differ slightly in genitalia, though of the same general pattern as *A. io*. In view of the inadequacy of the material, they are left undetermined.

Anisocentropus dilucidus McLachlan

PAPUA : Mondo, 5,000 ft., i-ii. 1934, 1 ♂, det. M. E. Mosely.
Previously recorded from New Guinea.

Family **LEPTOCERIDAE**
 Subfamily **TRIPLECTIDINAE**
Notanatolica gilolensis McLachlan

(Text-figs. 46-47)

WEST NEW GUINEA: Njau-limon, S. of Bougainville, 3,000 ft., ii. 1936, 1 ♂.
 PAPUA: Kokoda, 1,200 ft., vi-vii. 1933, 1 ♂, 2 ♀.

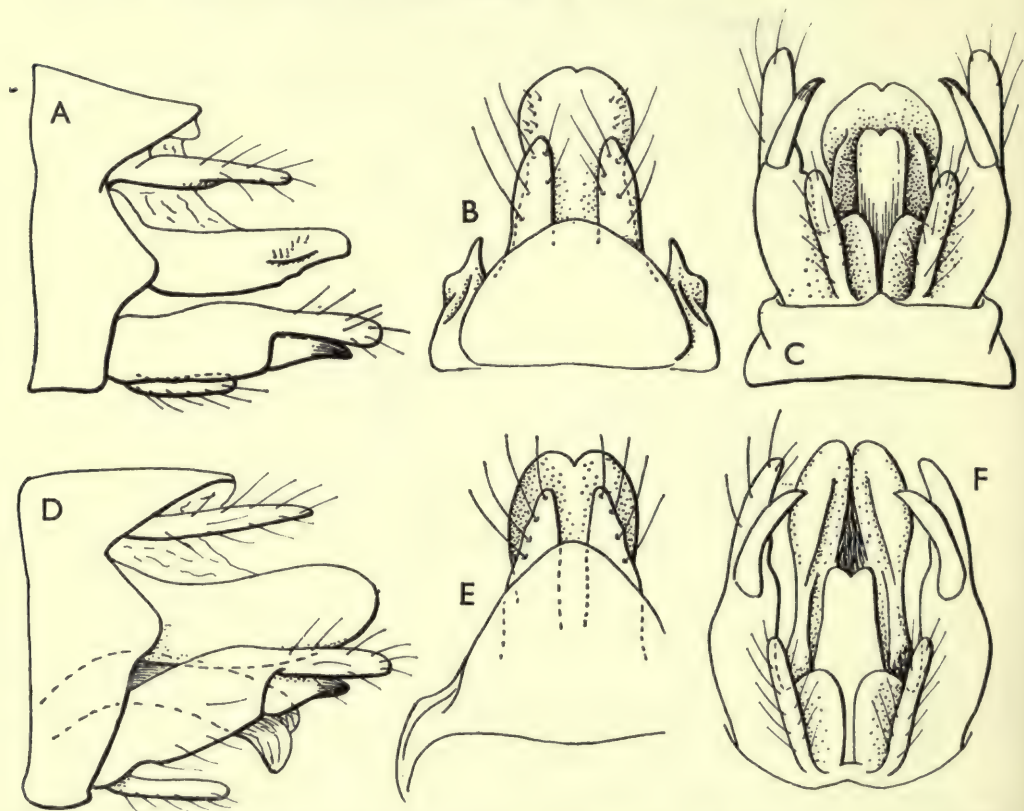


FIG. 47. *Notanatolica gilolensis* McLachlan. A-C, Genitalia (♂ Kokoda), A, lateral; B, ninth and tenth segments, dorsal; C, claspers, aedeagus and tenth segment, ventral; D-F, genitalia of ♂ allotype. Details as figs. A-C.

Mosely, in his 1936 *Revision of the Triplectidinae*, gives a fairly wide distribution for this species, based upon published records as well as on material in the British Museum (Nat. Hist.). Ulmer, in his 1951 *Trichoptera of the Sunda Islands*, quotes some correspondence which he had with Mosely as to the correctness of some of these records. I have studied the material in our collection and fully agree with Ulmer that much of it was misidentified. The examples from N. Borneo, Java and North

Australia determined by Banks belong to the *N. magna* group and the examples from Fiji and Dutch New Guinea determined by Mosely are also misidentified.

Since the type of *N. gilolensis* (a female) is so little known, I am figuring the wing venation, from which it will be seen that the discoidal cell in the fore wing is much longer and narrower than in the *magna* group of species, being about two-thirds as long as the thyridial cell. The fore wing, contrary to the statement made by Mosely, is not narrower than in *magna* when the wing has been properly flattened for drawing. In pinned specimens, the wing does tend to appear narrower, due partly to the deflexing of the anterior and posterior margins. In the hind wing, $Sc-R_1$ clearly terminates in R_2 and not in the wing margin. This also occurs (though less clearly) in the wing of the male figured by Mosely as the male of *gilolensis*, his fig. 43 being inaccurate.

Comparison of the male genitalia of the examples collected by Miss Cheesman with the male figured by Mosely shows slight individual differences in each specimen, chiefly in the shape of the tenth segment and degree of development of the ridges on its ventral surface. In the male allotype, the sides of the segment slope downwards at a steeper angle, making it appear deeper in side view and narrower in ventral view. In view of the limited material available (3 ♂) it would seem unjustified to consider these differences as more than individual variations, especially as considerable variation is known to occur in *magna*. Figures are given of the allotype and of the Kokoda males.

In addition to the holotype female and the material collected by Miss Cheesman, three males from the McLachlan collection enable the distribution to be given as Halmahera (Gilolo); New Guinea; Wetter Island and Ternate.

[*Notanatolica ?ciuska* (Mosely)]

DUTCH NEW GUINEA: Canoe Camp, Utaqua River, xii.1912, 2 ♂, 2 ♀, A. F. R. Wollaston, *Triplectides gilolensis* McL., det. M. E. Mosely.

The males agree reasonably well in terminalia with the type of *ciuska*, but are rather paler (? faded).

Previously recorded from New South Wales and Queensland.

Symphitoneurina fulva (Navás)

PAPUA: Mafulu, 4,000 ft., i.1934, 1 ♂.

DUTCH NEW GUINEA: Cyclops Mts., Sabron, 930 ft., v-vi.1936, 2 ♂; 1,200 ft., 22.v.1936, 1 ♀; Camp 2, 2,000 ft., vii.1936, 9 ♂, 4 ♀.

Previously recorded from New Guinea.

Symphitoneura sp.

PAPUA: Matsika, 3,000 ft., xii.1933, 1 ♂.

In view of the poor condition of the single example, it is not proposed to identify it more precisely.

Subfamily LEPTOCERINAE

Leptocerus cheesmanae sp. n.

(Text-fig. 48)

PAPUA: Kokoda, 1,200 ft., ix. 1933, 4 ♂.

All four specimens are in rather poor condition, but the male genitalia are sufficiently distinctive to warrant the description of a new species. Head black, with black and white pubescence. Antennae incomplete, basal segments fuscous, with white annulations. Palpi fuscous, with white pubescence. Thorax black. Legs fuscous. Fore wing fuscous, with black pubescence. There are two patches of white pubescence along the anterior margin and behind them and along the posterior margin are areas of broadened, silvery hairs. Hind wing with sparse fuscous pubescence.

♂ GENITALIA. Ninth segment cut back dorsally, where it is fused with the tenth. Apical margin of ninth sternite with a broad, shallow excision. Tenth segment forming a moderately narrow projection, extending beyond the ninth sternite and in dorsal view slightly dilated about midway. From its under surface project two asymmetric, apically bifid spines, each with a small digitate process at its base. Cerci absent (or fused with tenth segment). Aedeagus rather difficult to make out without dissection. On its dorsal surface towards the base, and flexibly attached to it by membrane, are two asymmetric, spiniform parameres. The left-hand and larger is strongly hooked downwards at its apex and the right-hand paramere is slender and only slightly sinuous. The aedeagus itself is twice sharply angled in side view, the apical part tapering and laterally compressed ventrally. At the more basal angulation arises, on each side, a slender spine which curls caudad along the aedeagus and shortly exceeds it in length, the apices of the two spines contiguous. Claspers fused basally, from the side dilating to a clavate apex, which is divided into a slender upper and a broad lower part. From beneath, the fused claspers are broad, the apical margin with a median excision, which is wider at its base. The apical margins and upper surface are armed with strong, socketed teeth and in dorsal view there is a median, cordate depression, also filled with socketed teeth.

Length of fore wing, ♂, 5.5 mm.

♂ HOLOTYPE mounted as microscope preparations, paratypes pinned. The markings of the fore wing are of a pattern which occurs in a number of species in Africa and Asia, such as *L. argentonigra* (Ulmer), Ceylon, and *L. canaliculata* (Ulmer), Philippines. The male genitalia of *L. cheesmanae* sp. n. show some resemblance to those of the latter species, in possessing a digitate upper branch to the clasper, but the relationship is not very close.

OECETIS McLachlan

Most of the Papuan species placed in this genus form a fairly compact group, characterized by having the so-called *r-m* cross-vein in the hind wing located beyond the fork of *M*, instead of basad of it as in the typical species of *Oecetis*. This cross vein is of course the basal part of *R*₅, the remainder of the vein being fused with *M* or with *M*₁₊₂. The position of this vein was used by Ulmer as a character when erecting his genus *Oecetodes* (type-species *Setodes avara* Banks, 1895). The same character occurs also in the following genera: *Oecetodella* Ulmer (type-species *Oecetodella singularis* Ulmer, 1930), in Milne's subgenera *Quaria* and *Yrula*, and in various other

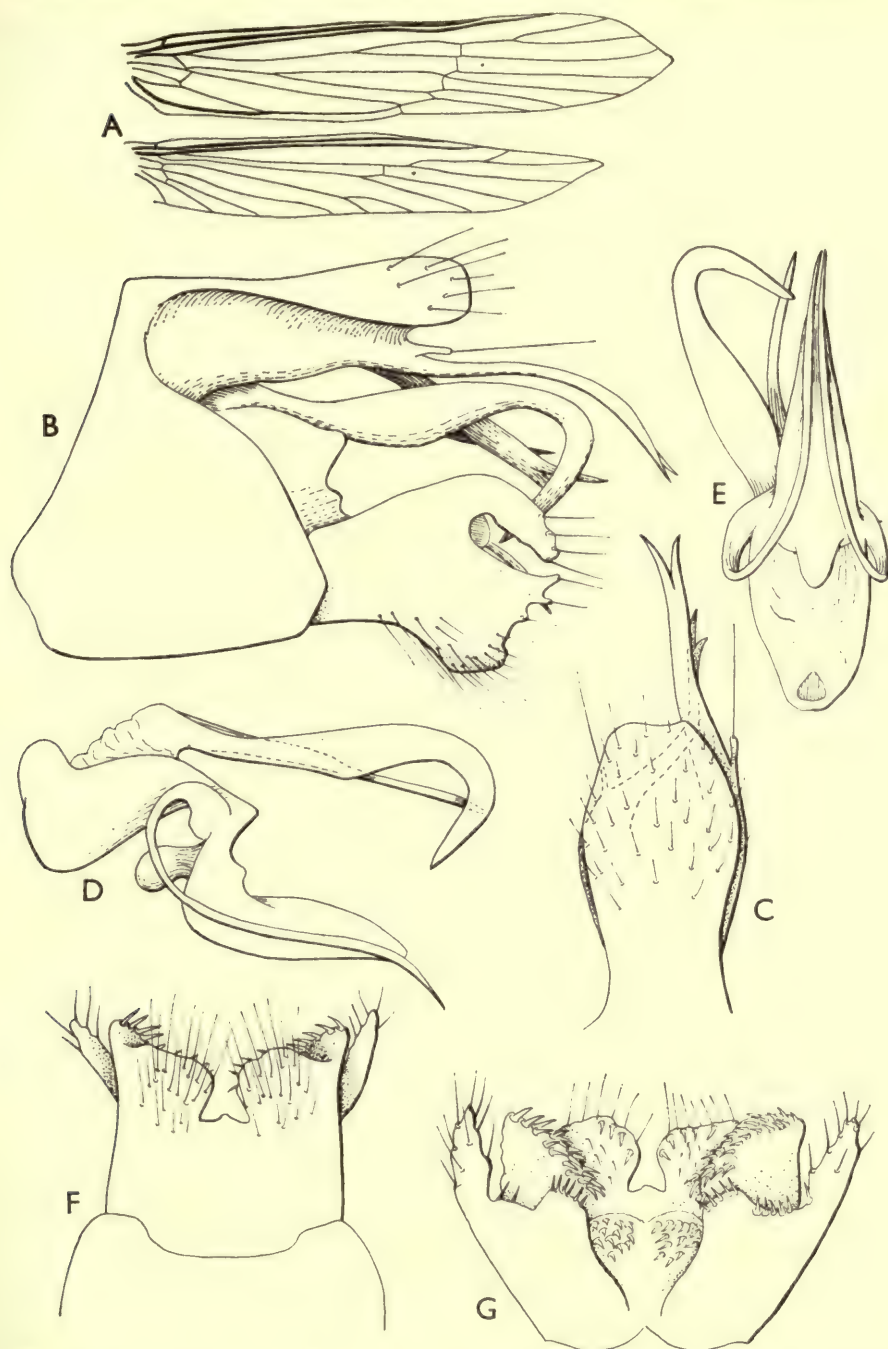


FIG. 48. *Leptocerus cheesmanae* sp. n. ♂. A, wings, B-G, genitalia; B, lateral; C, tenth segment, dorsal; D, aedeagus and parameres, lateral; E, the same, ventral; F, claspers, ventral; G, the same, dorsal, more spread out.

species which have been placed in the genus *Oecetis*. Ross (1944) has placed *Oecetodes* Ulmer amongst the synonyms of *Oecetis*, without any comment on the differences in venation of the hind wing. I did consider resurrecting *Oecetodes*, to contain all the species of *Oecetis* in which R_5 was located beyond the fork of M in the hind wing, but after a lengthy examination of the venation of as many of these species as possible, it became evident that they were not by any means a homogeneous group and I was unable to find any other venational character to support the use of the position of R_5 in the hind wing as a generic character, or to find satisfactory characters to split this group of species still further. One or two species were somewhat intermediate, R_5 joining M at the fork. I therefore propose to leave all these species in the genus *Oecetis* and hope that some day someone will make a comprehensive revision of the complex.

KEY TO THE NEW GUINEA SPECIES OF *Oecetis*, MALES

- | | | |
|---|--|----------------------------------|
| 1 | In hind wing, R_5 runs into the stem of M | 2 |
| - | In hind wing, R_5 runs into M_{1+2} | 4 |
| 2 | Fore wing with androconia | 3 |
| - | Fore wing without androconia | <i>hemerobioides</i> (McLachlan) |
| 3 | Androconia forming a dense, golden brown area in centre of wing | <i>squamosa</i> sp. n. |
| - | Androconia black, semi-erect, sparsely scattered along the veins | <i>buitenzorgensis</i> Ulmer |
| 4 | Fore wing narrow, about five times as long as wide. M_{3+4} fused with Cu_{1a} for a short distance beyond anastomosis. Tenth segment bilobed | <i>arctipennis</i> sp. n. |
| - | Fore wing three to four times as long as wide. M_{3+4} touching Cu_{1a} at a point or joined to it by a cross-vein. Tenth segment trilobed, lateral lobes sometimes indistinct | 5 |
| 5 | In fore wing, the cross-vein closing the discoidal cell is distinctly basad of anastomosis; lateral lobes of tenth tergite forming a broad hood over aedeagus, the latter without spiniform parameres | <i>ornata</i> sp. n. |
| - | In fore wing, the cross-vein closing the discoidal cell forming a more or less continuous line with the other veins of the anastomosis. Lateral lobes of tenth tergite narrower, often inconspicuous. Aedeagus with one to three spiniform parameres | 6 |
| 6 | Clasper in side view triangular, with a basal branch | <i>mambia</i> sp. n. |
| - | Clasper in side view long and slender, with or without a basal branch | 7 |
| 7 | Clasper with a short, upwardly directed projection on upper basal margin | 8 |
| - | Clasper without such projection | 9 |
| 8 | Tenth tergite less than half the length of the clasper | <i>acuminata</i> sp. n. |
| - | Tenth tergite nearly as long as clasper | <i>longiterga</i> sp. n. |
| 9 | Claspers each with a rounded lobe on inner margin at base | <i>marginata</i> sp. n. |
| - | A broad inner plate on left clasper and a strong hook on right | <i>asymmetrica</i> sp. n. |

Oecetis hemerobioides (McLachlan)

DUTCH NEW GUINEA: Cyclops Mts., Sabron, 930 ft., v-vi. 1936, 1 ♂.
Previously recorded from Celebes, Sumba and Malaya.

Oecetis squamosa sp. n.

(Text-fig. 49)

PAPUA: Kokoda, 1,200 ft., viii. 1933, 1 ♂.

The unique male was in rather poor condition. General colour tawny. Spurs o.?.2, mid legs missing. Wings sparsely clothed with tawny pubescence, most of the centre of the wing also

bearing small, reddish brown androconia, extending from R_1 to Cu_1 and from the origin of R_s to the apex of the discoidal cell and to about half-way between the anastomosis and wing tip in cells R_4 and M_{1+2} .

♂ GENITALIA. Ninth segment short, centre of dorsal margin scarcely produced. Cerci short, rounded apically, not fused with tenth segment, which is about twice as long as cerci, transparent, tapering to a narrow apex armed with a few short setae. Aedeagus short and stout, its lower

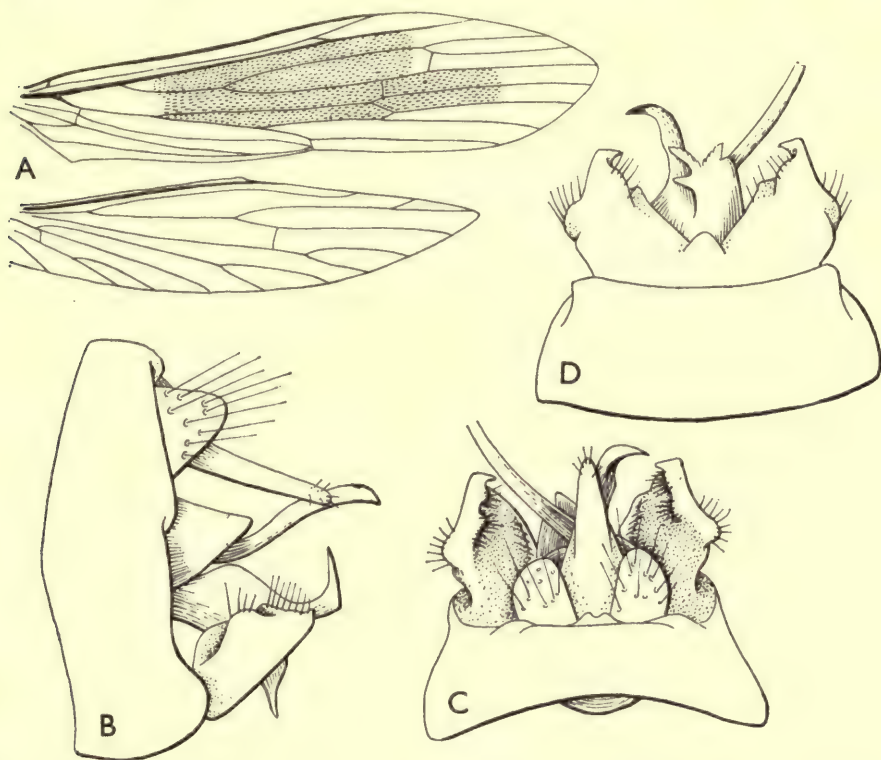


FIG. 49. *Oecetis squamosa* sp. n. ♂. A, wings; B, genitalia, lateral; C, dorsal; D, ventral.

apical margin produced in an asymmetrical trough, the left-hand margin of which is extended upwards in a recurved hook. Projecting from the aedeagus is a single, curved, spiniform paramere, its apex broken in the type. Clasper short and stout, inner and outer upper margins elevated in ridges, apex terminating in an incurved hook. From beneath, the claspers are broad and fused basally.

Length of fore wing, ♂, 6 mm.

♂ HOLOTYPE mounted as microscope preparations. This species resembles *O. unicolor* McLachlan (New Zealand) and *O. pechana* Mosely (Australia) in the presence of scales or androconia on the membrane of the fore wing of the male. In *O. squamosa* they are more extensive than in either of the other two species. It is a smaller insect and the male genitalia, although of the same pattern, differ considerably in detail, particularly in the claspers.

Oecetis buitenzorgensis Ulmer

PAPUA: Kokoda, 1,200 ft., vi, vii. 1933, 2 ♂.

Previously recorded from Java.

Oecetis arctipennis sp. n.

(Text-fig. 50)

PAPUA: Kokoda, 1,200 ft., ix, 1933, 1 ♂.

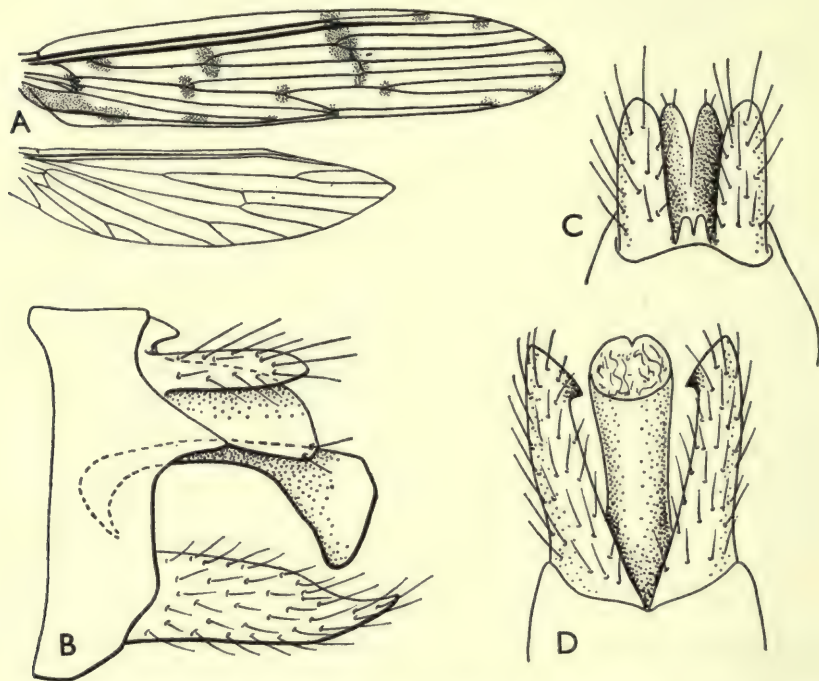


FIG. 50. *Oecetis arctipennis* sp. n. ♂. A, wings; B, genitalia, lateral; C, ninth and tenth segments, dorsal; D, claspers and aedeagus, ventral.

Head and thorax yellowish brown, darker above, with pale fuscous pubescence. Antennae pale, not annulate. Palpi with pale fuscous pubescence, basal segment of maxillary palpus shorter than second. Legs pale, spurs 0.2.2. Wings long and narrow, anterior lightly clothed with golden pubescence, the membrane marked with brownish as in Text-fig. 50A. Fore wing with apical cells long and narrow, M_{3+4} separating from Cu_{1a} beyond the anastomosis. In the hind wing, R_s joins M_{1+2} beyond the fork of M . Anterior branch of $2A$ fused with $1A$ for most of its length, separating again to give a short fork.

♂ GENITALIA. Ninth tergite with apical margin slightly convex, side-pieces acute and triangular. Tenth segment forming a roof over aedeagus, the sides sloping downwards, its apex excised to give two rounded lobes, each of which carries one or two setae. Cercus about as long as tenth segment, stout and digitate. Aedeagus in side view with a dorso-ventrally compressed stem, the

apex dilated downwards. Clasper a little longer than aedeagus, tapering gently to a slightly upturned apex in side view, parallel-sided with obliquely truncate apices in ventral view, the inner apical angle produced in a short, stout tooth.

Length of fore wing, ♂, 8 mm.

♂ HOLOTYPE pinned, one pair of wings mounted between cover-glasses, abdomen cleared and in glycerine. Although R_5 in the hind wing runs into M_{1+2} , and the apical cellules are rather long and narrow, as in most of the other Papuan *Oecetis* in this group, this species may be distinguished by M_{3+4} in the fore wing being fused for a short distance with Cu_{1a} and by the differently formed male genitalia, especially the aedeagus, which has no internal parameres and by the shorter, non-caliper-like claspers. The partial fusion of $1A$ and $2A$ in the hind wing, although present on both sides, may be an aberration.

Oecetis ornata sp. n.

(Text-fig. 51)

DUTCH NEW GUINEA: Humboldt Bay, ix-x.1893, W. Doherty, ex McLachlan Coll., 1 ♂.

General colour pale brownish. Spurs 0.2.2. Anterior wing densely ciliate on margins, hairs long and golden. Membrane brown basally, hyaline apically, the brownish part with irregular hyaline markings, the apical part with brownish markings along the veins and cross-veins. Hind wing smoky hyaline, densely ciliate. In the fore wing, cell R_2 overlaps the apical third of the discoidal cell; thyridial cell unusually short, its base about level with base of discoidal cell. In hind wing, R_s forks at about one-third from base, R_5 falling on M_{1+2} well beyond fork of M .

♂ GENITALIA. Ninth segment with dorsal apical margin not produced, side-pieces stout and triangular. Cerci short and clavate, heavily fringed with hairs. Tenth segment trilobed, the median lobe digitate, extending beyond the cerci. Lateral lobes at a lower level than the median, triangular at apices, together forming an excised hood above the aedeagus, slightly shorter than the median lobe. Aedeagus short and stout, apex rounded dorsally and with a median ventral excision. There is a short, transverse ridge on the lower surface towards the base. Clasper short and stout, in side view with a rounded elevation on the dorsal inner margin about midway and with the upper apical angle produced upwards in a short, blunt finger. From beneath, the claspers are fused basally, with a narrow, median excision, apices slightly incurved, inner surfaces concave and armed with stout setae.

Length of fore wing, ♂, 6 mm.

♂ HOLOTYPE mounted as microscope preparations. This species, although sharing with the following species the character of R_5 beyond the fork of M in the hind wing and the rather long apical cells, differs from them in the noticeable overlap of cell R_2 over the discoidal cell, the short thyridial cell and pattern of the fore wing and in the form of the male genitalia.

Oecetis mambia sp. n.

(Text-fig. 52)

PAPUA: Kokoda, 1,200 ft., v, vii, viii, x.1933, 3 ♂, 6 ♀.

Spurs 0.2.2. General colour brownish fulvous. Fore wing membrane pale fulvous, veins a little darker, with two rows of rather long, dense hairs on both surfaces. Costal and apical margins

with a very dense fringe of brownish hairs. A tuft of black hairs about midway along Cu_2 and a less conspicuous one on the stem of M . Hind wing smoky hyaline, with fuscous veins, also densely fringed, margins from apex of Sc to anal angle very densely fringed. In hind wing, R_s forks at about one-third from base, fork R_2 as long as its footstalk.

♂ GENITALIA. Ninth segment short, dorsal apical margin shallowly excised. Tenth segment deeply trilobed, median lobe longer and more sclerotized than lateral lobes, digitate, somewhat

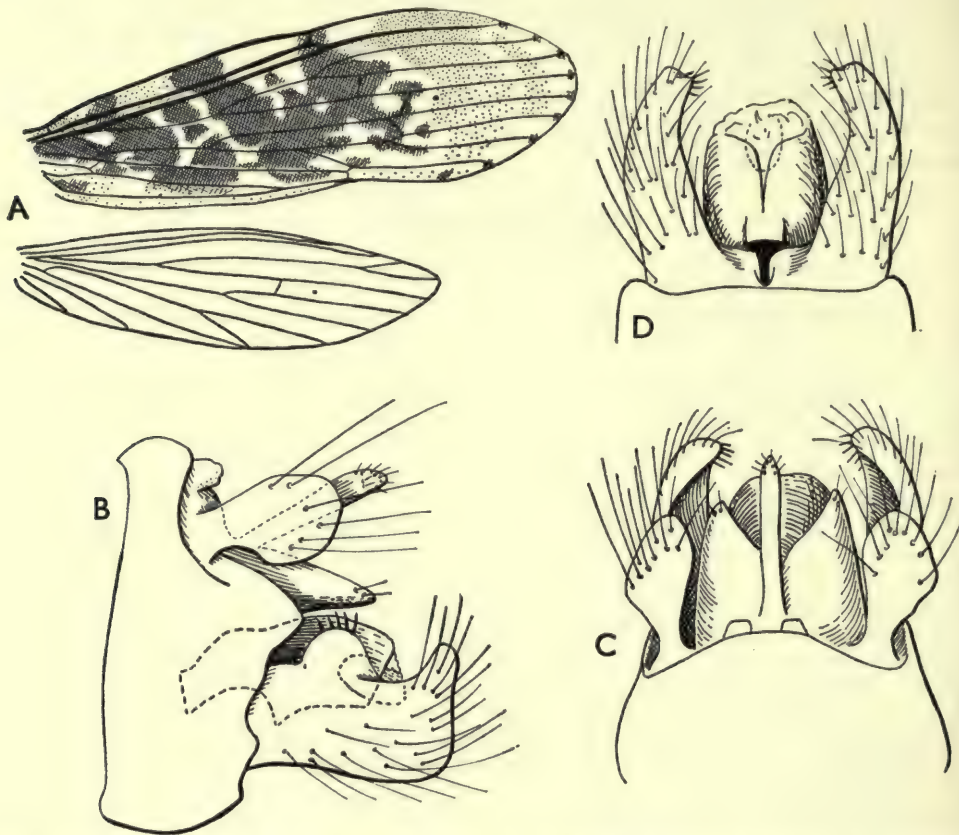


FIG. 51. *Oecetis ornata* sp. n. ♂. A, wings; B, genitalia, lateral; C, dorsal; D, claspers and aedeagus, ventral.

lanceolate at apex in dorsal view, slightly downcurved in side view. Lateral lobes divergent, transparent, each with a single bristle near apex. Cerci short and broad. Aedeagus stout, lower margin with an asymmetric apical hook, and enclosed in the membrane is a single, curved spine. Clasper narrow at base in side view, upper margin elevated in a short, curved process at base, then gradually tapered to a pointed, incurved apex.

♀ GENITALIA. Eighth sternite produced in a large, pentagonal subgenital plate, angles rounded, its base formed by a furrow, which partly differentiates it from the sternite. Ninth tergite large and deep, triangularly produced in side view. Lateral gonapophyses with upper margin much humped. Tenth segment with rounded lateral lobes enclosing the anal tube.

Length of fore wing, ♂, 9 mm., ♀, 8 mm.

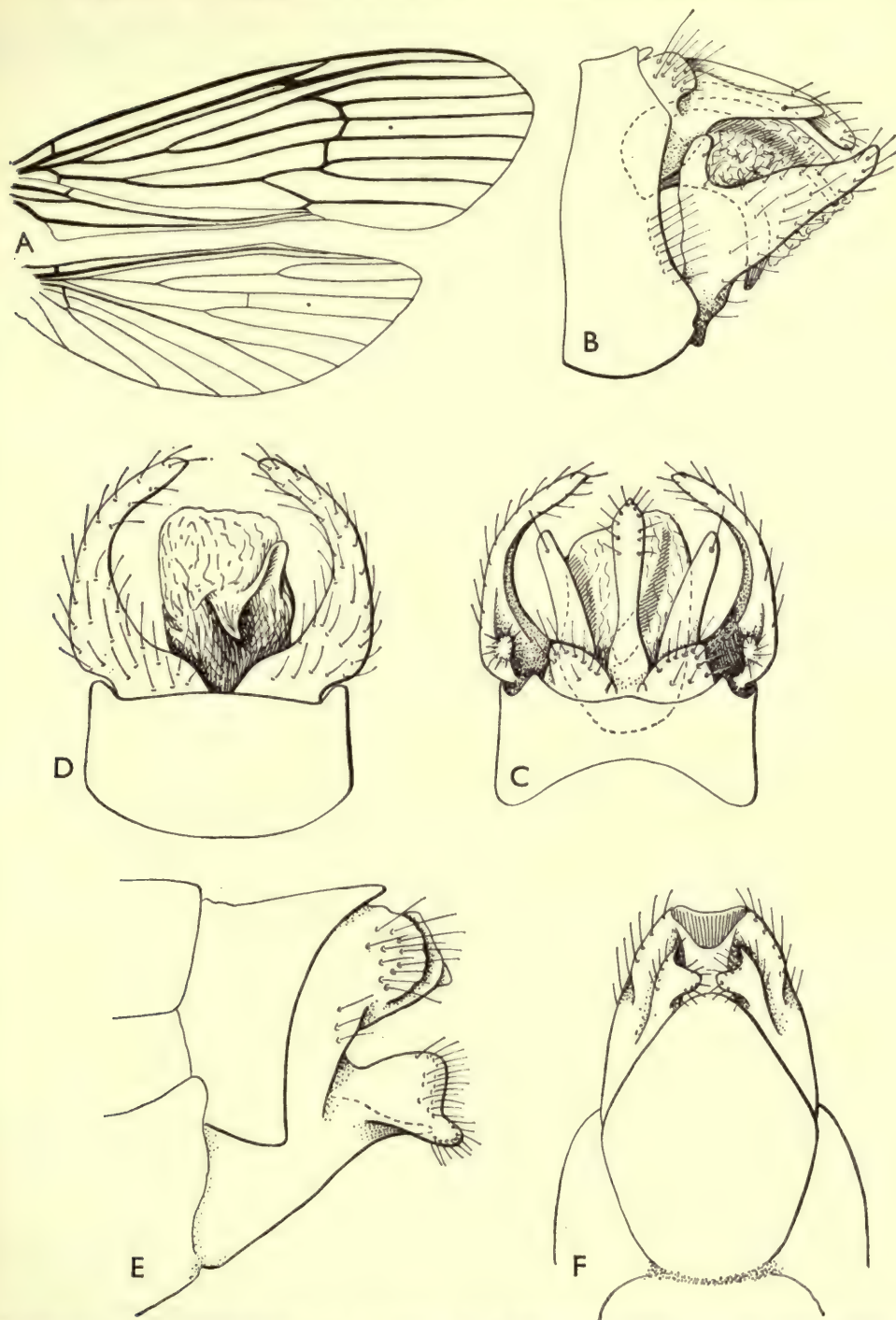


FIG. 52. *Oecetis mambia* sp. n. A, ♂, wings; B, ♂ genitalia, lateral; C, the same, dorsal; D, ♂, claspers and aedeagus, ventral; E, ♀ genitalia, lateral; F, the same, ventral.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, with apex of abdomen in glycerine. This species differs from *O. marginata* sp. n. and *O. asym-*

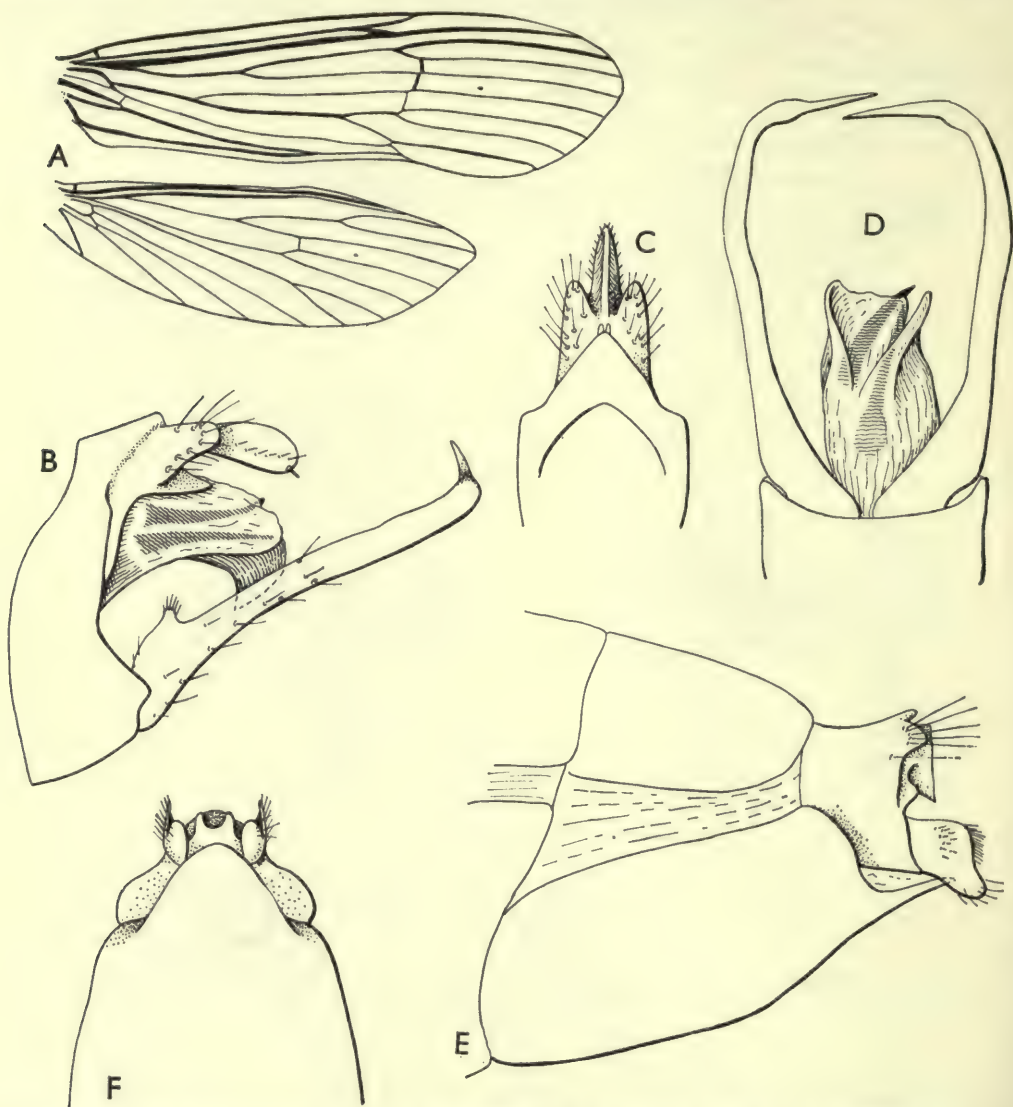


FIG. 53. *Oecetis acuminata* sp. n. A, ♂, wings; B, ♂ genitalia, lateral; C, ♂, ninth and tenth tergites, dorsal; D, claspers and aedeagus, ventral; E, ♀ genitalia, lateral; F, the same, ventral.

metrica sp. n. in the absence of the marginal bands of scales in the ♂ wings, the stouter claspers and stronger lateral lobes of the tenth segment in the male and in the female genitalia. The name "Mambia" is that of one of the Papuan "boys" employed by Miss Cheesman at Kokoda.

Oecetis acuminata sp. n.

(Text-fig. 53)

PAPUA: Kokoda, 1,200 ft., v, vi, viii-x. 1933, 2 ♂, 4 ♀.

Spurs 0.2.2. General colour dark fulvous. Antennae only faintly annulated. Fore wing with margins neither scaly nor unusually densely fringed. Cross-veins of anastomosis not thickened. In hind wing, fork R_2 about as long as its footstalk. The R_5 "cross-vein" falling on the upper branch of M .

♂ GENITALIA. Ninth segment short, dorsal margin triangularly produced at its centre. Tenth segment trilobed, median lobe elongate, laterally compressed, in side view clavate, projecting well beyond cerci. Lateral lobes short, thin and triangular, at a lower level than the median lobe, in dorsal view obscured by the cerci. The latter are bluntly triangular. Aedeagus stout, asymmetric, enclosing two spiniform parameres. Clasper very long and slender, its apical forth abruptly inturned and acuminate. At the base there is a small process on the upper margin.

♀ GENITALIA. Eighth sternite very large, its apex parabolically produced. Ninth tergite with its apical margin produced in a rounded lobe on each side. Lateral gonapophyses of the normal type. Anal tube short and deep, projecting a little beyond the ninth tergite.

Length of fore wing, ♂, 7.5 mm., ♀, 7 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, abdomen in glycerine, paratypes pinned. In the slender claspers, the male shows some relationship with *O. marginata* sp. n. and *O. asymmetrica* sp. n., but it lacks the marginal scales of the wings. The large eighth sternite of the female is distinctive.

Oecetis longiterga sp. n.

(Text-fig. 54)

DUTCH NEW GUINEA: Lake Sentani, Iffar, viii. 1936, 1 ♂.

The unique male is somewhat damaged. Head and thorax tawny yellow, only bases of antennae present. Maxillary palpus with basal segment shorter than second. Legs mostly missing, spurs 0.2.?. Wings tawny yellow, anterior fairly densely fringed along costal margin, anastomosis fuscous.

♂ GENITALIA. Ninth tergite narrowed dorsally. Tenth tergite with a slender, digitate median lobe, slightly downcurved at its apex, nearly twice as long as the cerci. On either side of the median lobe is a slender, transparent process, possibly the lateral lobe of the tenth tergite. Cercus narrow, foliate, acute at apex. Aedeagus short and stout, enclosing two curved, spiniform parameres. Its apex is asymmetric, the left side being membranous, the right produced in a blunt, curved plate. Claspers fused basally, produced in long, slender, inwardly and upwardly curved, acute apices. Near the base, the dorsal margin is produced upwards in a small, setose hump.

Length of fore wing, ♂, 8.5 mm.

♂ HOLOTYPE pinned, one pair of wings between cover-glasses, abdomen in glycerine. This species is closely related to *O. acuminata* sp. n., the male genitalia following the

same pattern but differing in detail. The median lobe of the tenth tergite and the cerci are both relatively much longer and narrower. The slender, transparent lateral lobes apparently replace the short, triangular lobes of *acuminata*. The clasper is more sinuous in side view and gently incurved (not angled) in ventral view. The

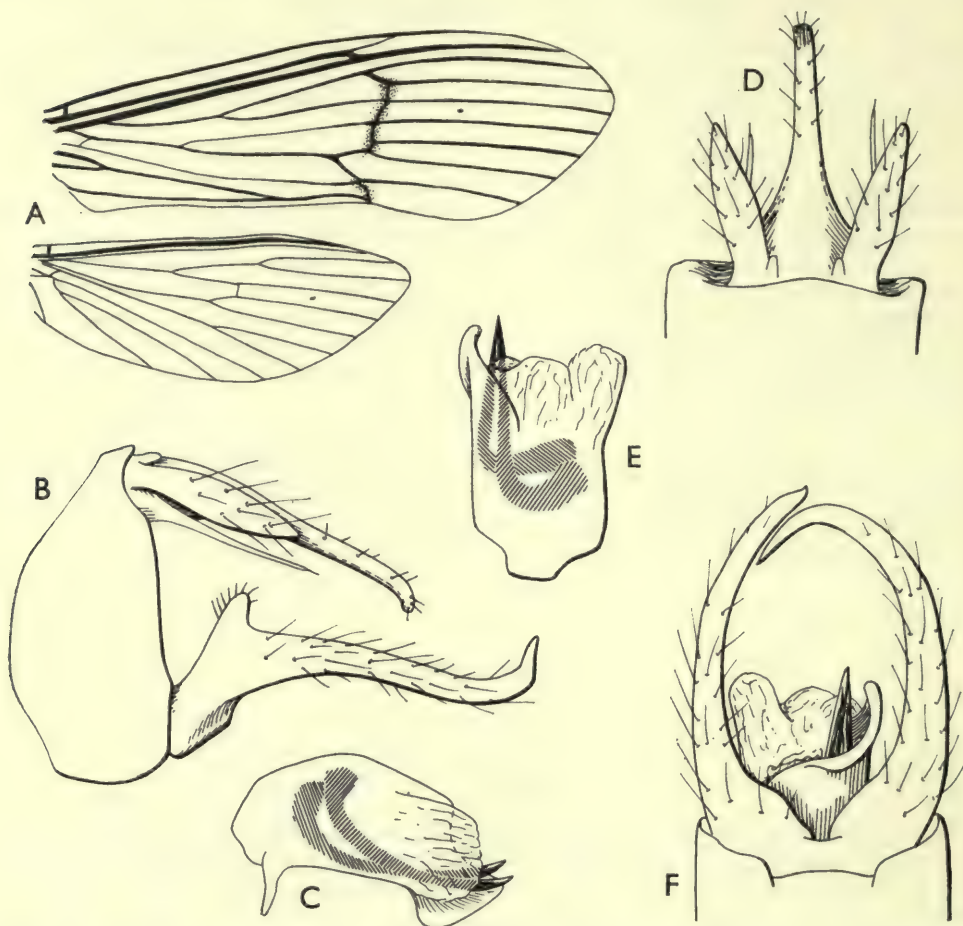


FIG. 54. *Oecetis longiterga* sp. n. ♂. A, wings; B, genitalia, lateral; C, aedeagus, lateral; D, ninth and tenth tergites, dorsal; E, aedeagus, dorsal; F, claspers and aedeagus, ventral.

venation of the fore wing is similar to that of *acuminata*, but the apical part of the wing is somewhat broader in relation to its length. The hind wing is rather broader and fork R_2 is longer in relation to its footstalk; Cu_{1a} forks only slightly beyond the level of the fork of M . There is a fragmentary second specimen from the same locality, consisting of head, thorax and one fore wing, which may belong here.

Oecetis marginata sp. n.

(Text-figs. 55-56)

PAPUA: Kokoda, 1,200 ft., iv, vi-x. 1933, II ♂, ? ♀.

♂. Spurs 0.2.2. General colour fulvous. Antennae luteous, faintly annulated with brownish; basal and third segments moderately long but less so than in *Oecetodella* and without a long

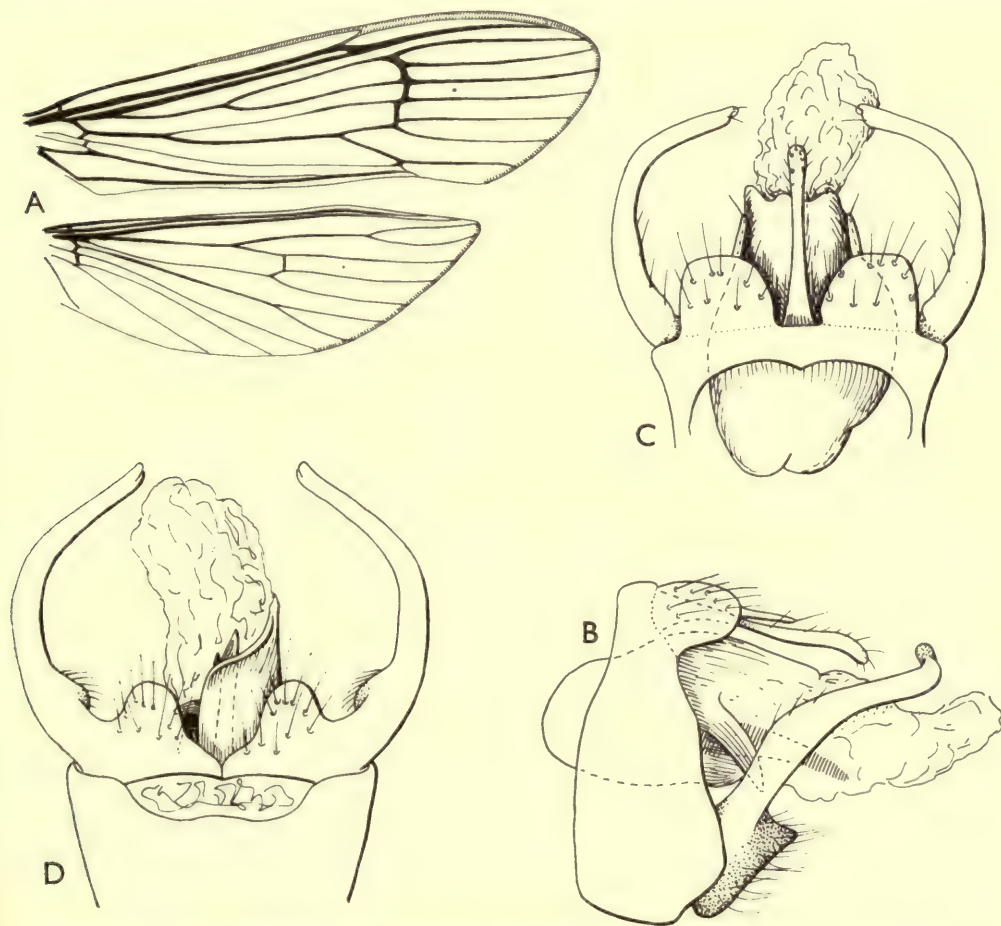


FIG. 55. *Oecetis marginata* sp. n. ♂. A, wings; B, genitalia, lateral; C, dorsal; D, claspers and aedeagus, ventral.

pencil of hairs. Wings moderately pubescent, the hairs in the apical third of the wing denser on the veins and forming two divergent rows. A small tuft of black hairs about midway along Cu_2 in fore wing. In fore wing, the veins of the anastomosis are thickened and fuscous. Apical margins of both wings without obvious fringe. In the male, under low magnification, these margins look soiled, as though with mud. Close examination reveals a narrow border of minute, dense scales, in the fore wing extending from about one-fourth from the base of the costa round

to the arculus, and in the hind wing from the apex to about the vein Cu_2 . Basad from this vein is a dense, silky fringe, interspersed with scales. In the fore wing, the costal margin is thin and folded over to make a narrow groove. In the hind wing, R_5 fuses with M_{1+2} distad of the median fork.

♂ GENITALIA. Ninth segment short, narrowed above. Cerci forming a pair of flattened, subquadrate plates, fused to the margin of the ninth and with a quadrate excision between them. Tenth segment consisting of a slender median process, slightly sinuous from the side, with a pair of very transparent fingers (about half as long as the median process), one on each side, terminating in a seta. Aedeagus somewhat globular, rather obscured by everted membrane, and enclosing three flattened, spiniform parameres, of unequal length, the shortest curved

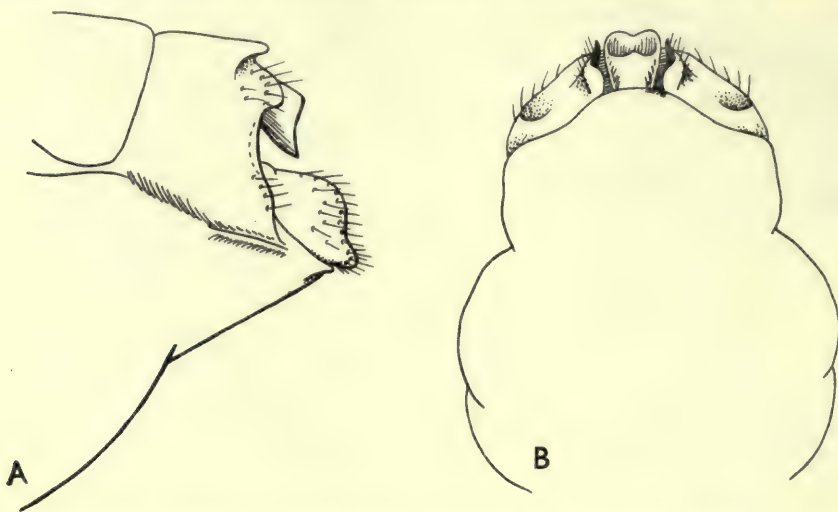


FIG. 56. *Oecetis marginata* sp. n. ♀ Genitalia. A, lateral; B, ventral.

downwards. Claspers long, slender, sinuous and incurved, each with a flattened basal lobe and a smaller lobe on the inner margin a little beyond the basal lobe.

Length of fore wing, ♂, 10 mm.

♂ HOLOTYPE pinned, one paratype mounted as microscope preparations, remainder pinned. In venation and structure of genitalia, this species is related to *O. koyana* Kimmins (Sarawak). It differs in the short, plate-like cerci and different tenth segment and more slender and incurved claspers. It also differs in the dense, minute scales bordering the male wings.

Nine females are presumed to belong to this species on the evidence of similarity of hind wing venation. They are rather smaller in wing-spread, slightly darker in colour and of course do not have the wings margined with minute scales.

♀ GENITALIA. Eighth sternite produced in a large subgenital plate, its apical margin sinuously rounded. Ninth tergite produced at its centre in a small, blunt finger, on either side of which is a small, triangular, hairy lobe. Lateral gonapophyses with a sinuous upper margin, tapering to a narrow, rounded apex. Tenth segment forming a short anal tube, its lower apical margin produced, upper excised.

Length of fore wing, ♀, 7–8 mm.

Oecetis asymmetrica sp. n.

(Text-fig. 57)

PAPUA: Kokoda, 1,200 ft., v-vii, ix-x. 1933, 12 ♂, ? 1 ♀.

♂. Spurs 0.2.2. General colour brownish fulvous. Antennae faintly annulated with fuscous. Wings rather less densely pubescent than in *O. marginata* sp. n., but with a similar black tuft on Cu_2 in the fore wing. The margins also bear similar minute scales, but in the fore wing the

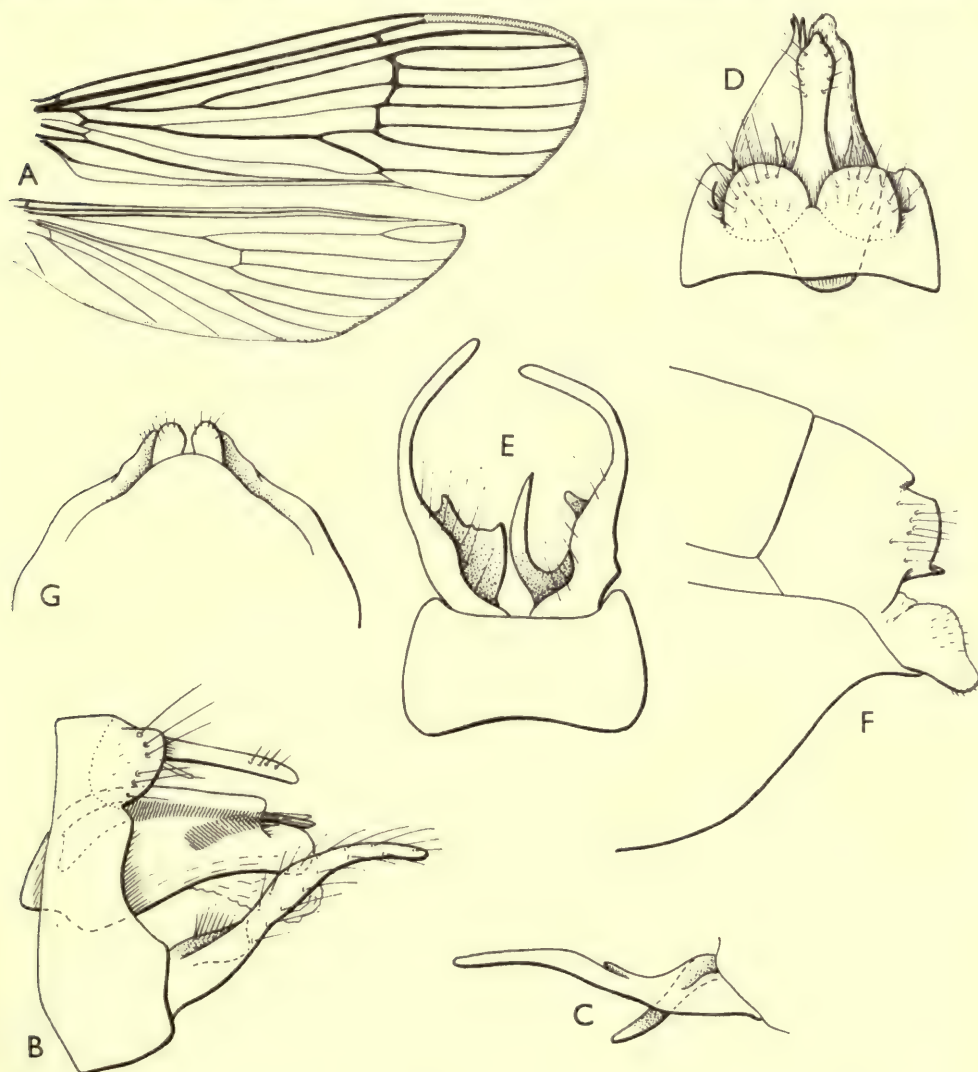


FIG. 57. *Oecetis asymmetrica* sp. n. A, ♂, wings; B, ♂, genitalia, lateral; C, ♂, right clasper, lateral; D, ♂, ninth and tenth tergites, dorsal; E, ♂, claspers, ventral; F, ♀, genitalia, lateral; G, the same, ventral.

scaly area is less extensive, commencing beyond the anastomosis, which is thickened. Apex of fore wing less pointed. Hind wing less pointed, the dense silky fringe from Cu_1 to the base of the wing with a greenish metallic sheen in certain lights. Apical fork R_2 much shorter than its footstalk.

♂ GENITALIA. Following the same general pattern as *O. marginata*. The cerci are less prominent, broader than long. Median process of the tenth segment stouter, straight in side view, dilated slightly before apex in dorsal view. Transparent fingers obscure. Aedeagus stout, tapering towards apex, asymmetric and enclosing two spiniform, curved parameres. Claspers long and slender from the side, incurved from beneath, with asymmetric lobes internally at base. The left clasper has a plate-like lobe extending over the basal third, its inner margin excised to make two blunt processes. The lobe of the right clasper is much more deeply excised, so that the basal process forms a long, curved spine, widely separated from the apical process and visible as a tailwardly directed process in side view.

Length of fore wing, ♂, 8 mm.

♂ HOLOTYPE mounted as microscope preparations, paratypes pinned. This species is a close relative of *O. marginata* and the differences are set out in the foregoing description.

A single female is referred, with some doubt, to this species on the similarity of the venation of the hind wing.

♀ GENITALIA. Eighth segment with its ventral margin more sinuous in side view. Anal tube fused with ninth segment and largely concealed. Lateral lobes of the ninth tergite more quadrate than in *O. marginata*. Lateral gonapophyses blunter at apices.

Length of fore wing, ♀, 7 mm.

Oecetis spp.

DUTCH NEW GUINEA: Cyclops Mts., Sabron, 930 ft., v. 1936, 2 ♀.

Japen Island, Mt. Eiori, 2,000 ft., ix. 1938, 1 ♀.

PAPUA: Kokoda, 1,200 ft., vi-ix. 1933, 8 ♀.

Mt. Tafa, 8,500 ft., iii. 1934, 1 ♀.

The first two specimens may possibly be the females of *O. longiterga* sp. n., but being from a different locality, it seems unwise to associate them definitely.

TRIAENODES McLachlan

KEY TO SPECIES OF *Triaenodes* FROM NEW GUINEA (MALES)

Triaenodes loraii Navás is omitted owing to its inadequate description.

- | | | |
|---|--|----------------------------|
| 1 | No spiniform branch arising from base of clasper | 2 |
| - | Spiniform branch present | 4 |
| 2 | Aedeagus moderately stout, with parameres | 3 |
| - | Aedeagus long, slender, spiniform, without parameres | <i>longispina</i> sp. n. |
| 3 | Costal area of fore wing with a dense, longitudinal band of broadened black hairs on under surface | <i>costalis</i> sp. n. |
| - | Costal area without such hairs | <i>insulana</i> Ulmer |
| 4 | Median lobe of tenth segment very short. Basal branch of clasper consisting of two slender spines. Fore wing with two longitudinal bands of black androconia on dorsal surface, in costal and radial areas | <i>nigrolineata</i> sp. n. |
| - | Median lobe of tenth segment long. Basal spiniform branch single. Fore wing without bands of black androconia | 5 |

- | | | |
|---|---|------------------------|
| 5 | Tenth segment not produced in spines | 6 |
| - | Tenth segment produced in spines | 7 |
| 6 | Tenth segment about as long as median lobe and cerci. Basal branch of clasper stoutly spiniform | <i>tafana</i> sp. n. |
| - | Tenth segment much shorter than median lobe or cerci. Basal branch of clasper slender | <i>mondoana</i> sp. n. |

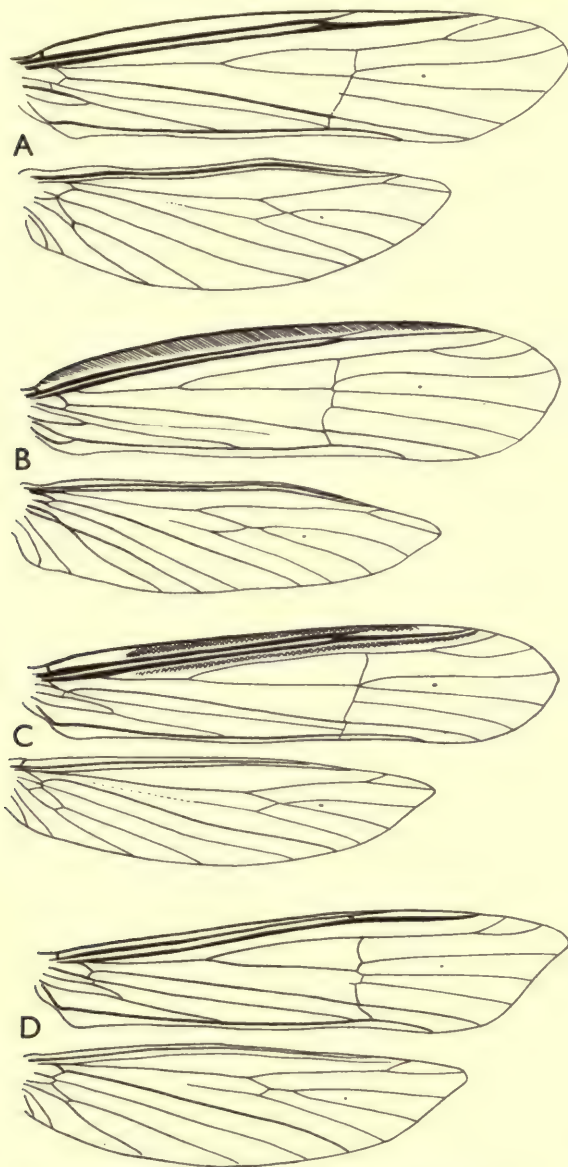


FIG. 58. Wings of *Triaenodes* spp. n. ♂. A, *longispina*; B, *costalis*; C, *nigrolineata*; D, *tafana*.

- 7 Median lobe of tenth segment terminating in a downwardly directed beak. Clasper with a complex, coral-like inner branch *corallina* sp. n.
 — Median lobe of tenth segment not beaked at apex. Clasper without such inner branch 8
 8 Fore wing almost entirely pale golden *aurea* sp. n.
 — Fore wing golden, with a fuscous apex *ustulata* sp. n.

***Triadenodes longispina* sp. n.**

(Text-figs. 58–59)

PAPUA : Kokoda, 1,200 ft., iv–viii. 1933, 2 ♂, 4 ♀.

General colour yellowish. Antennae luteous, strongly annulated with fuscous, the annulations becoming less distinct towards apices. Basal segment long, densely clothed with golden hairs. In a cleared male example can be seen a longitudinal flap running the length of the segment and covering a basal tuft of hairs. Maxillary palpi densely pubescent, mainly golden but fuscous at articulations. Legs yellowish, anterior tibia and tarsus brownish externally. Anterior wing with fine golden pubescence and with two distinct, and two less evident, spots of fuscous pubescence along the anal margin. In the apical area are three faint, transverse streaks of fuscous pubescence, one just basad of the anastomosis, another (more oblique) from the apex of the discoidal cell to the middle of the cell Cu_{1a} and the third from the anterior margin to R_5 . Hind wing hyaline, very sparsely pubescent.

♂ GENITALIA. Ninth segment narrowed dorsally, the apical margin produced in a transverse plate. Ventral margin much more produced and quadrate in ventral view. Tenth segment trilobed, the median lobe short, digitate, bearing two rows of short setae. Lateral lobes very long and spiniform, curving downwards. Cerci a little longer than median lobe of tenth segment, digitate. Aedeagus also very long, spiniform and curved, paralleling the spines of the tenth segment. Claspers fused basally, about twice as long as the ninth segment. Basally they are stout, tapering somewhat towards the apices. From the side, the apex is dilated and set with numerous setae, arising from elevated bases. The outer apical angle forms a strong, incurved hook and there is also a small finger-like projection above the base of the hook.

♀ GENITALIA. Eighth sternite with apical margin slightly convex, fringed with setae. Ninth and tenth tergites more or less fused, the line of fusion evident in side view as a "step" on the dorsal surface, but becoming very indefinite on the sides. The tenth segment forms a short, tapering anal tube with a truncate apex in side view. Bursa copulatrix as figured. There appears to be a membranous tube or sac at the base, much telescoped near its attachment to the bursa.

Length of fore wing, ♂, 8 mm., ♀, 7 mm.

♂ HOLOTYPE (iv. 1933) mounted as microscope preparations, ♀ allotype (vii. 1933) pinned, with abdomen cleared and in glycerine, paratypes pinned. This species differs from *T. insulana* Ulmer and *T. costalis* sp. n. in the absence of the long, hood-like production of the tenth tergite and in its long, slender, spiniform appendages.

***Triadenodes costalis* sp. n.**

(Text-figs. 58, 60)

PAPUA : Kokoda, 1,200 ft., viii. 1933, 1 ♂.

Head tawny yellow, with fulvous pubescence. Antennae pale, with fuscous annulations, basal segment long and bearing a longitudinal flap covering, at the base, a tuft of black hairs and with a tuft of golden hairs at the apex of the segment. Thorax tawny yellow, with fulvous pubescence. Legs pale fulvous. Fore wing densely clothed with fulvous pubescence and with two small fuscous spots along the posterior margin, the outer one at the arculus. The costal margin bears a dense fringe of broadened, black hairs on the under surface, directed obliquely

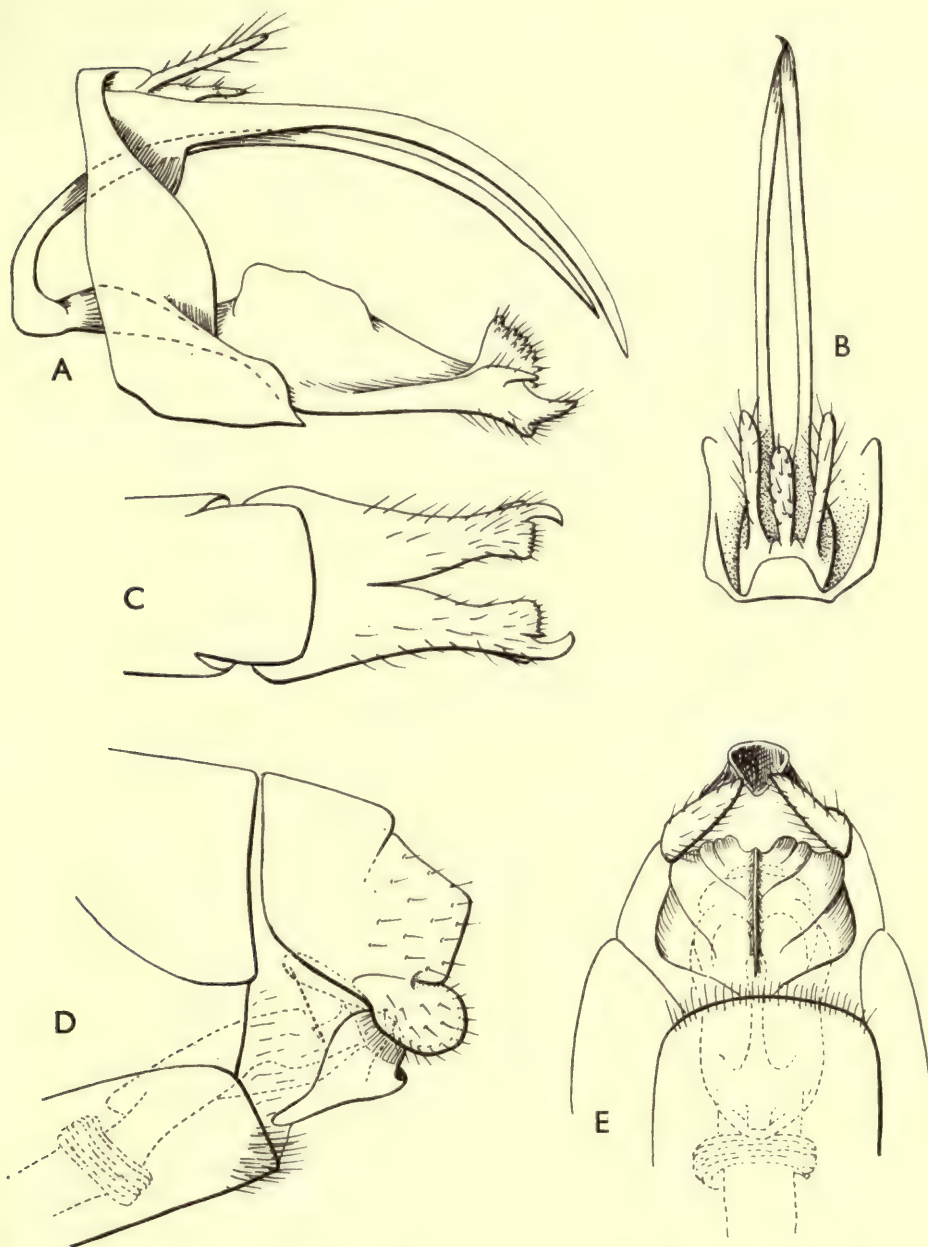


FIG. 59. *Triaenodes longispina* sp. n. Genitalia. A, ♂, lateral; B, ♂, ninth and tenth tergites, dorsal; C, ♂, ninth segment, claspers, ventral; D, ♀, lateral; E, ♀, ventral.

towards the apex of the wing and giving, in the pinned specimen, the appearance of a costal fold. Hind wing with fairly dense fuscous pubescence.

♂ GENITALIA. Ninth segment narrowed to a transverse rib dorsally, the ventral margin produced in a quadrate lobe with concave lateral margins and a shallow median excision. Tenth segment large and complex; the upper portion comprised a slender median process between

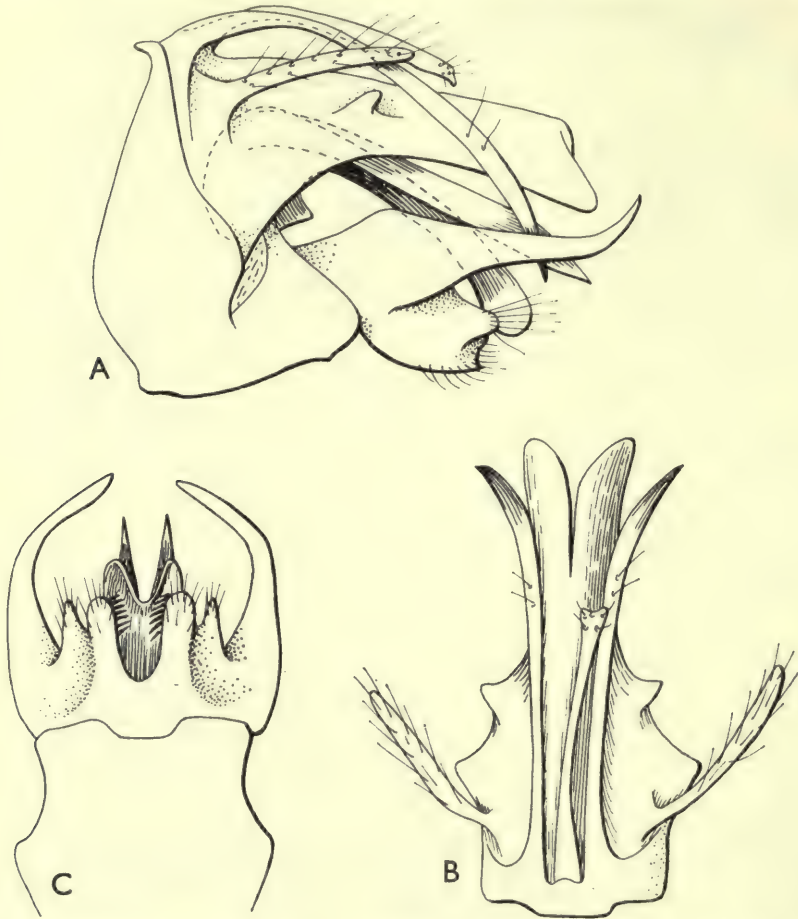


FIG. 60. *Triaenodes costalis* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth segment, claspers and aedeagus, ventral.

two downcurved spines, which are half as long again as the median process. The lower portion forms a long, roof-like hood over the aedeagus, broad at its base, tapering to a narrow, bifid apex, which is obliquely truncate in side view. On each side, about midway, arises a short, blunt process. Cerci (left-hand missing in type) slender, digitate and divergent. Aedeagus stout at base, with a slender stem, trough-like and with an excised apex in ventral view; two slender, blade-like parameres. Claspers with broad, fused bases and with slender, incurved, acute apices. From beneath, the basal part forms two rounded projections and the inner surface carries some much-branched processes, armed with stout setae.

Length of fore wing, ♂, 8 mm.

♂ HOLOTYPE mounted as microscope preparations. In the structure of the male genitalia, this species appears to have some affinity with *T. insulana* Ulmer, from Kei Island. There is a similar, rather long, hood-like tenth segment, the main branch of the clasper is rather long and caliper-like and there is no spiniform basal branch. There are, however, two blade-like parameres, which may be homologous with the spines rather confusingly shown in Ulmer's figure, partly in solid and partly in broken line. In detail the genitalia are adequately distinct. Ulmer makes no mention of the costal band of broadened black hairs on the under surface of the fore wing.

***Trienodes nigrolineata* sp. n.**

(Text-figs. 58, 61)

PAPUA: Kokoda, 1,200 ft., v. 1933, 1 ♂.

Head tawny, with fulvous hairs. Antennae pale, annulated with fuscous, basal segment long, with a longitudinal flap covering traces of a basal tuft of hairs. Palpi fulvous. Thorax tawny, with golden pubescence. Legs luteous. Fore wing densely clothed with fulvous pubescence,

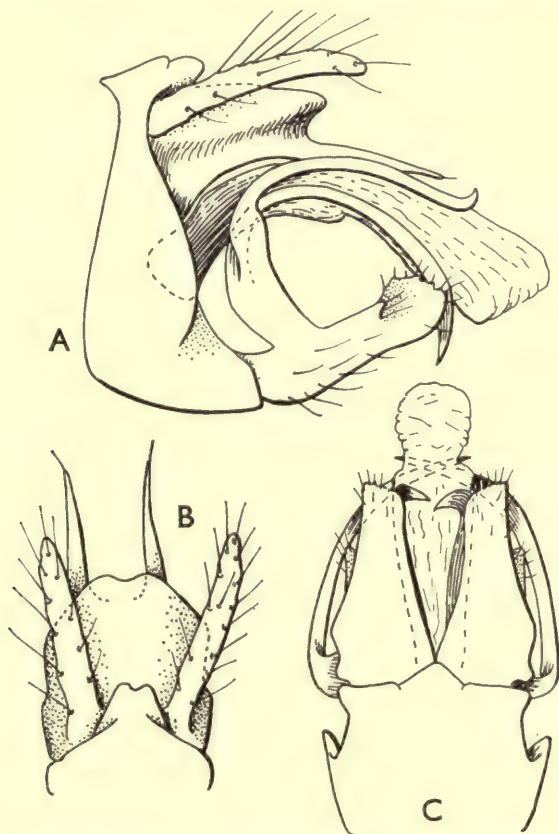


FIG. 61. *Trienodes nigrolineata* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth segment, claspers and aedeagus, ventral.

with scattered spots of fuscous pubescence along the posterior margin, at the anastomosis and in the apical cellules. In the costal and radial areas are two clearly-defined, jet-black streaks composed of short, broad androconia on the dorsal surface of the wing. Hind wing with sparse, fuscous pubescence.

♂ GENITALIA. Ninth segment narrowed above, but with the centre of the apical dorsal margin produced in a triangular plate with a bilobed apex. Cerci long and stout, digitate, slightly downcurved. Tenth segment forming a thickened, broad plate, covering the aedeagus, apex tapered and slightly excised. From beneath the apex arise two slender processes, apices transparent and each armed with a short seta. Aedeagus slender at base, arched downwards, apex membranous. Clasper with the main part slender from the side, apex slightly clavate and setose. The outer, upper margin is produced in a small, triangular lobe about midway. From beneath, the main part is broad at base, tapering to a truncate apex. On the upper surface towards the base is a transverse ridge, from which arises a pair of long, curved spines, the outer directed upwards and then curving caudad and inwards over the aedeagus. The inner spine is directed upward and caudad, running closely alongside the aedeagus.

Length of fore wing, ♂, 6 mm.

♂ HOLOTYPE mounted as microscope preparations. This species differs from the previously mentioned ones in the presence of spiniform, basal branches of the claspers.

Trienodes tafana sp. n.

(Text-figs. 58, 62)

PAPUA: Mt. Tafa, 8,500 ft., iii. 1934, 2 ♂.

General colour dark fulvous. Head with golden hairs. Antennae fulvous, annulated basally with gold. Basal segment long, clothed with a mixture of golden and fuscous hairs. There is a large oval flap on the dorsal surface, covering a ligulate structure. Palpi fulvous, annulated with fuscous. Thorax fuscous above, with golden pubescence, yellowish on the sides and beneath. Legs clothed with yellowish and fuscous pubescence. Fore wing with fuscous and pale golden pubescence, the latter forming marginal spots in the apical cellules and less definite markings elsewhere. There is a dark fuscous tuft about midway along the anal margin and another just beyond the arculus. Hind wing hyaline, sparsely pubescent. Apices of both wings very slightly falcate.

♂ GENITALIA. Ninth segment narrowed dorsally to a transverse band. Ninth sternite moderately produced and rounded in ventral view. Cerci moderately long, flattened dorso-ventrally, tapering apically. Tenth segment forming a hood over the aedeagus, broad at its base in dorsal view, tapering to an excised apex. From its base on the upper surface arises a slender, digitate, median process, as long as the hood. Aedeagus long, curved, its upper surface membranous and with a single, spiniform paramere beneath. Clasper in side view somewhat swollen in basal half, apical half narrower and curved upwards. From the base of the clasper arises a strong, curved, blunt spine, terminating in a single seta. From beneath, the clasper is less dilated in its basal half, and the upcurved apical part tapers to an out-turned apex.

Length of fore wing, ♂, 6.5 mm.

♂ HOLOTYPE mounted as microscope preparations, paratype pinned. This species differs from *T. nigrolineata* sp. n. in the absence of the two lines of black androconia on the fore wing, the single, stout spiniform branch of the clasper and the longer median lobe of the tenth segment. Tenth segment not produced in spines.

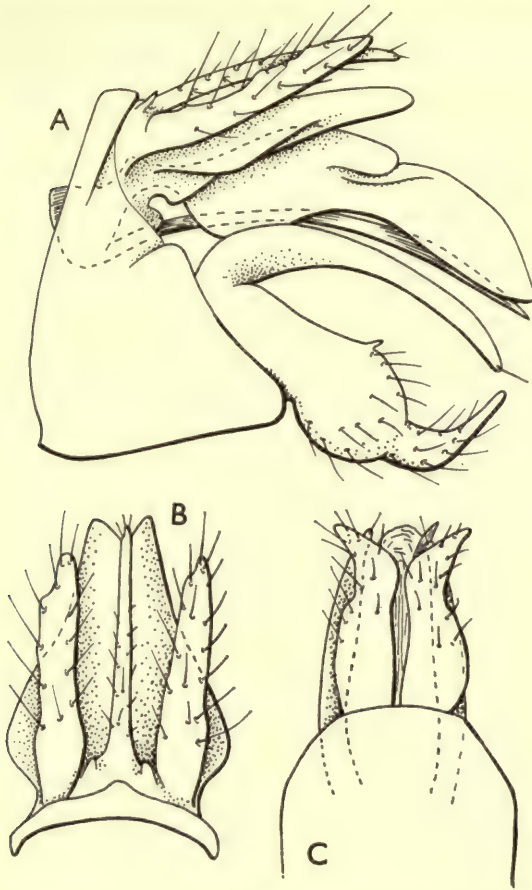


FIG. 62. *Triaenodes tafana* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth segment, claspers and aedeagus, ventral.

***Triaenodes mondoana* sp. n.**

(Text-figs. 63, 64)

PAPUA: Mondo, 5,000 ft., I. 1934, 1 ♂.

General appearance much as in *T. tafana* sp. n. The insect is rather smaller, the wings narrower and the fore wing blotched with fuscous and light and dark golden pubescence. Apex of fore wing not falcate, of hind wing only slightly falcate.

♂ GENITALIA. Ninth segment narrowed above but with the apical margin convexly produced at its centre. Ventral margin produced in a short, transverse plate, the centre of whose apical margin is slightly excised. Cerci digitate, slightly divergent. Tenth segment forming a short hood with lateral margins turned down and apices slightly produced. From the base there arises an elongate, slender median process, whose apex is bifid in dorsal view. Aedeagus long, arched, the dorsal surface membranous and somewhat granulose, apparently without parameres. Claspers each with a spiniform basal branch, asymmetric in the type. Both are directed first

towards the base of the abdomen and then curve upwards and caudad alongside the aedeagus. That of the left clasper is a very weak, slender, rather short spine but that on the right is stronger and much longer, curving upwards and crossing over the dorsal surface of the aedeagus. The

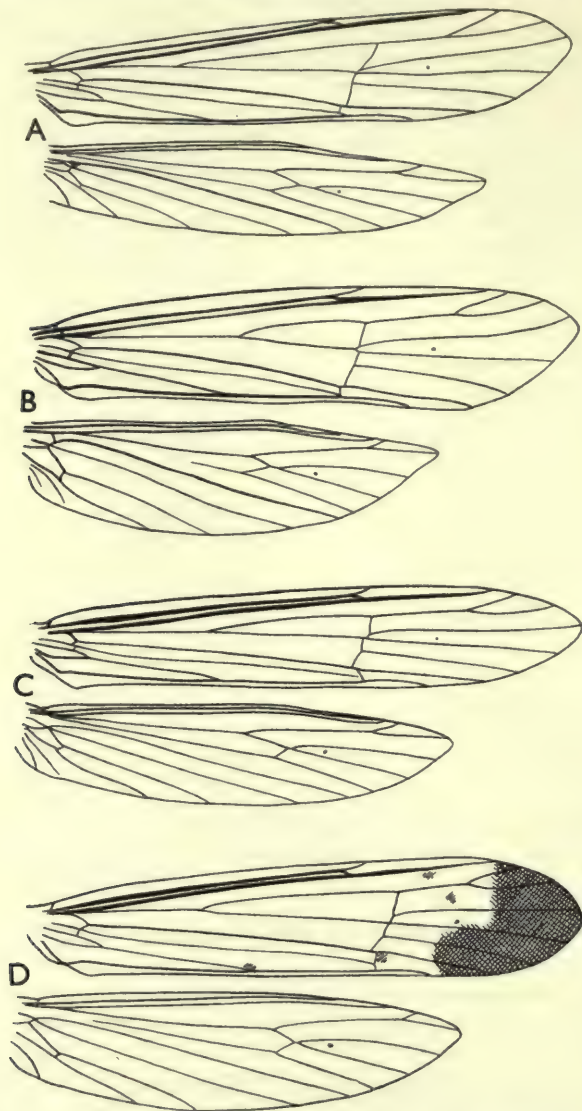


FIG. 63. Wings of *Triaenodes* spp. n. ♂. A, *mondoana*; B, *corallina*; C, *aurea*; D, *ustulata*.

main part of the clasper is about as long as the ninth segment, its width at base in side view about two-fifths of its length, tapering gently to the apex. The upper surface is irregularly serrate. From beneath, the claspers are fused basally, and in their apical two-thirds each is slightly sinuously parallel-sided, inner apical margin set with socketed teeth.

Length of fore wing, ♂, 5.5 mm.

♂ HOLOTYPE pinned, one pair of wings mounted between cover-glasses, abdomen in glycerine. This species is very similar in general appearance to the previous one but the male genitalia are entirely distinct. The fact that two such comparatively

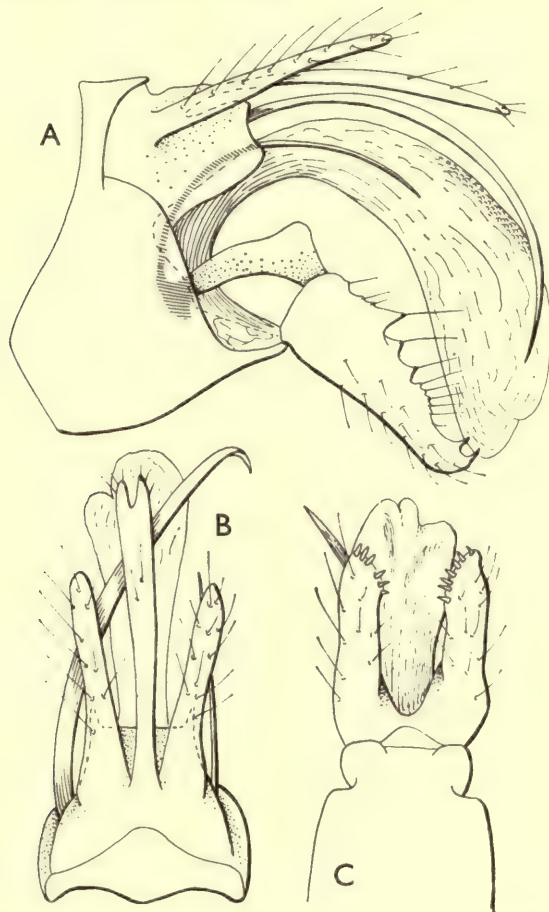


FIG. 64. *Triaenodes mondoana* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth segment, claspers and aedeagus, ventral.

similar insects should have such different male genitalia stresses the danger of attempting to associate males and females on general appearance.

***Triaenodes corallina* sp. n.**

(Text-figs. 63, 65)

PAPUA: Kokoda, 1,200 ft., vii, ix. 1933, 2 ♂.

General appearance and wing pattern as in *T. longispina* sp. n. Wing venation also similar, but apices of wings more acute, that of the hind wing being slightly falcate.

♂ GENITALIA. Ninth segment cut back dorsally to a narrow, transverse band. Ventral margin quadrately produced, with a wide excision in ventral view. Cerci digitate, moderately stout. Upper part of tenth segment forming a long, slender median process, lower apical margin pro-

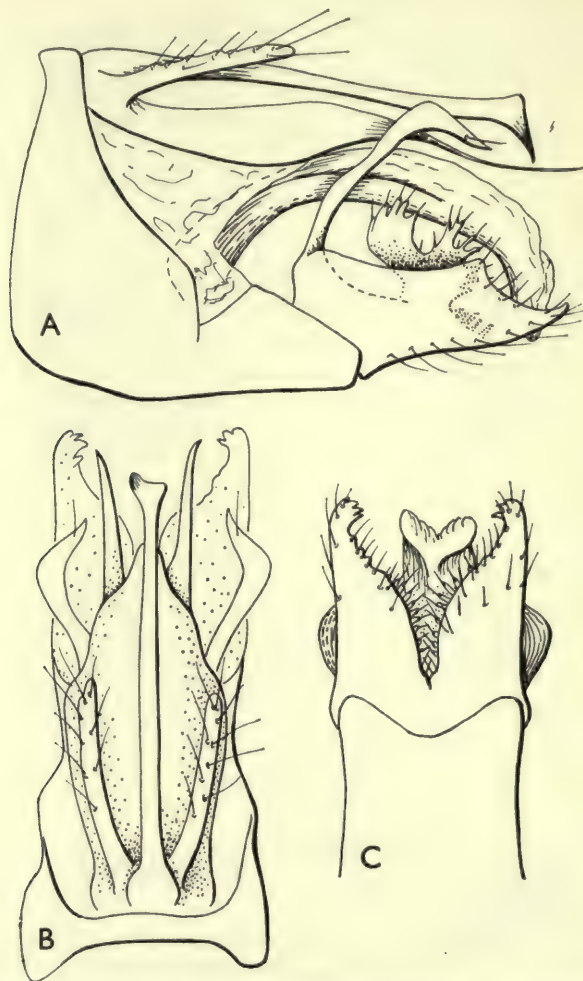


FIG. 65. *Triaenodes corallina* sp. n. ♂ Genitalia. A, lateral ; B, ninth and tenth tergites, dorsal ; C, ninth segment, claspers and aedeagus, ventral.

duced downwards in an acute beak. Lower part of the tenth segment forms a long hood, broad at its base, lateral margins tapering sinuously to a rounded apex. From beneath the apex extend two long, slender, semi-transparent processes, reaching slightly beyond the apex of the upper part. Aedeagus moderately long, slender at base, arching downwards. Claspers fused basally. The main part is about twice as long as deep in side view, its apex obliquely excised, the lower apical angle pointed. From the inner surface about midway arises a branched, somewhat coral-like structure, all its terminal branches armed with short setae. Spiniform basal

branch erect, its apex directed caudad. From beneath, the apex of the main part of the clasper is strongly serrate.

Length of fore wing, ♂, 8.5 mm.

♂ HOLOTYPE mounted as microscope preparations, paratype pinned. This species may be recognized by the beaked apex of the median process of the tenth segment, the rather long tenth segment with slender apical spines and by the complex, coral-like inner branch of the clasper.

Trienodes aurea sp. n.

(Text-figs. 63, 66)

PAPUA : Mt. Tafa, 8,500 ft., iii. 1934, 1 ♂.

General appearance yellowish, with golden pubescence. Antennae luteous, with fuscous annulations. Basal segment long, densely clothed with long golden pubescence. The dorsal flap on this segment is small, barely covering the basal half. Thorax with long golden pubescence. Legs luteous. Fore wing with dense golden pubescence, a patch of fuscous pubescence half-way along anal margin and an indistinct patch of fuscous pubescence about half-way between anastomosis and apex. Hind wing with sparse golden pubescence. Wings rather narrow, apices not falcate. Discoidal cell in fore wing elongate, about as long as its footstalk.

♂ GENITALIA. Ninth segment dorsally fused with tenth. Ninth sternite produced in a quadrate lobe with sinuous apical margin. Cerci long, digitate. Tenth segment forming a broad, plate-like hood, its lateral apical angles produced in long, downcurved spines, with a U-shaped excision between them. Median lobe of tenth segment also very long, exceeding the cerci, slender and digitate, with a short, transparent process on each side about midway. Aedeagus long and arched downwards, membranous above. Claspers fused basally, each composed of a basal branch and with the main part of the clasper divided into an outer and an inner lobe. The basal branch is slender, about as long as clasper and arched beneath the aedeagus. The outer lobe is roughly triangular in side view, digitate in ventral view. The inner lobe, which is also the lower, is about twice as long as the outer. It is slightly forcipate, the inner margin with a serrate projection about midway, apex of clasper acute.

Length of fore wing, ♂, 8.5 mm.

♂ HOLOTYPE mounted as microscope preparations. This species may be recognized by the almost entirely golden fore wings and by the distinctive male genitalia.

Trienodes ustulata sp. n.

(Text-figs. 63, 67)

PAPUA : Kokoda, 1,200 ft., v-vii. 1933, 1 ♂, 14 ♀.

Head tawny, with golden hairs. Antennae luteous, with fuscous annulations, basal segment long, clothed with golden hairs; in the male, the flap is as long as segment. Maxillary palpi with fuscous pubescence. Thorax tawny, with golden pubescence on dorsum. Legs luteous. Fore wing with dense golden pubescence on most of wing, except the apex, which is fuscous. Hind wing with sparse fuscous pubescence. In fore wing, discoidal cell is longer than its footstalk.

♂ GENITALIA. Ninth sternite produced in a transverse lobe with a truncate apex. Dorsal margin of ninth segment fused with tenth and produced in a long, tapering, sclerotized spine with a bifid apex. This is probably the more than usually sclerotized median lobe of the tenth

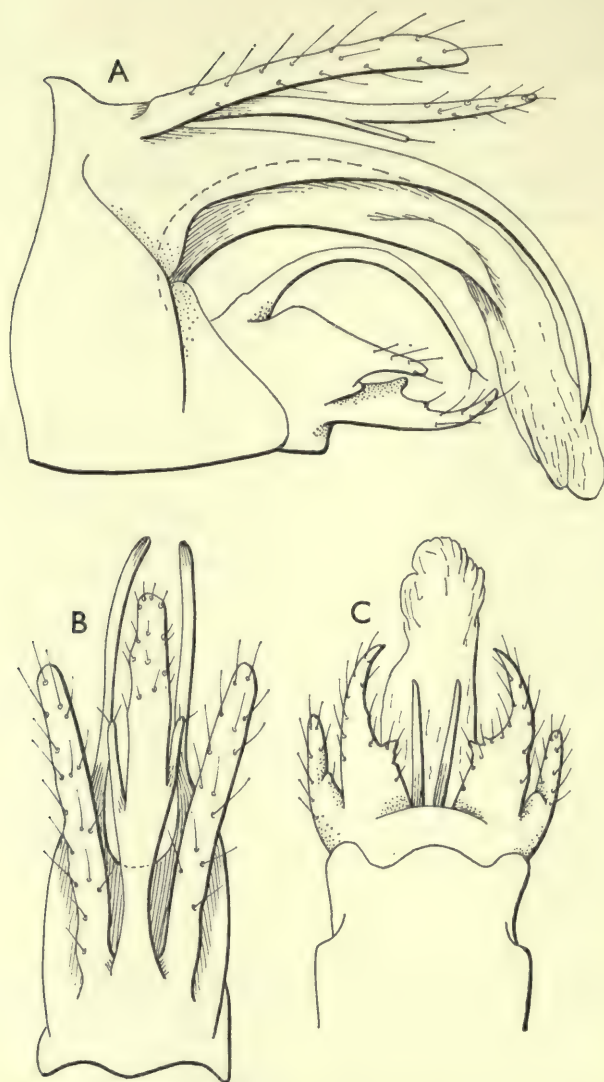


FIG. 66. *Triaenodes aurea* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth segment, claspers and aedeagus, ventral.

segment. Lateral lobes of the tenth segment also produced in long, sinuous spines. Cerci about half as long as median lobe, in side view dilated about midway, in dorsal view slender. Aedeagus short and arched, membranous above. Claspers fused basally, short, divided into an upper and a lower branch, in addition to the usual basal branch. The latter is spiniform, sickle-shaped, with a short, ventral spur about midway. Upper branch of clasper arising about midway along lower branch, somewhat clavate in side view and setose. Lower branch tapering to an acute apex in side view, broadly triangular in ventral view.

♀ GENITALIA. Eighth sternite truncate apically and fringed with setae. Ninth and tenth

tergites fused to form a hood, apex truncate in side view. Tenth sternite (?) forming a short, transverse plate with an elongated apodeme. Lateral gonapophyses somewhat reniform in side view, a deep excision between each and the apical margin of the combined ninth and tenth segments. Bursa copulatrix as figured.

Length of fore wing, ♂, 6 mm., ♀, 5-6 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, abdomen in glycerine, paratypes pinned. The fuscous tips of the fore wings make this species easily recognizable.

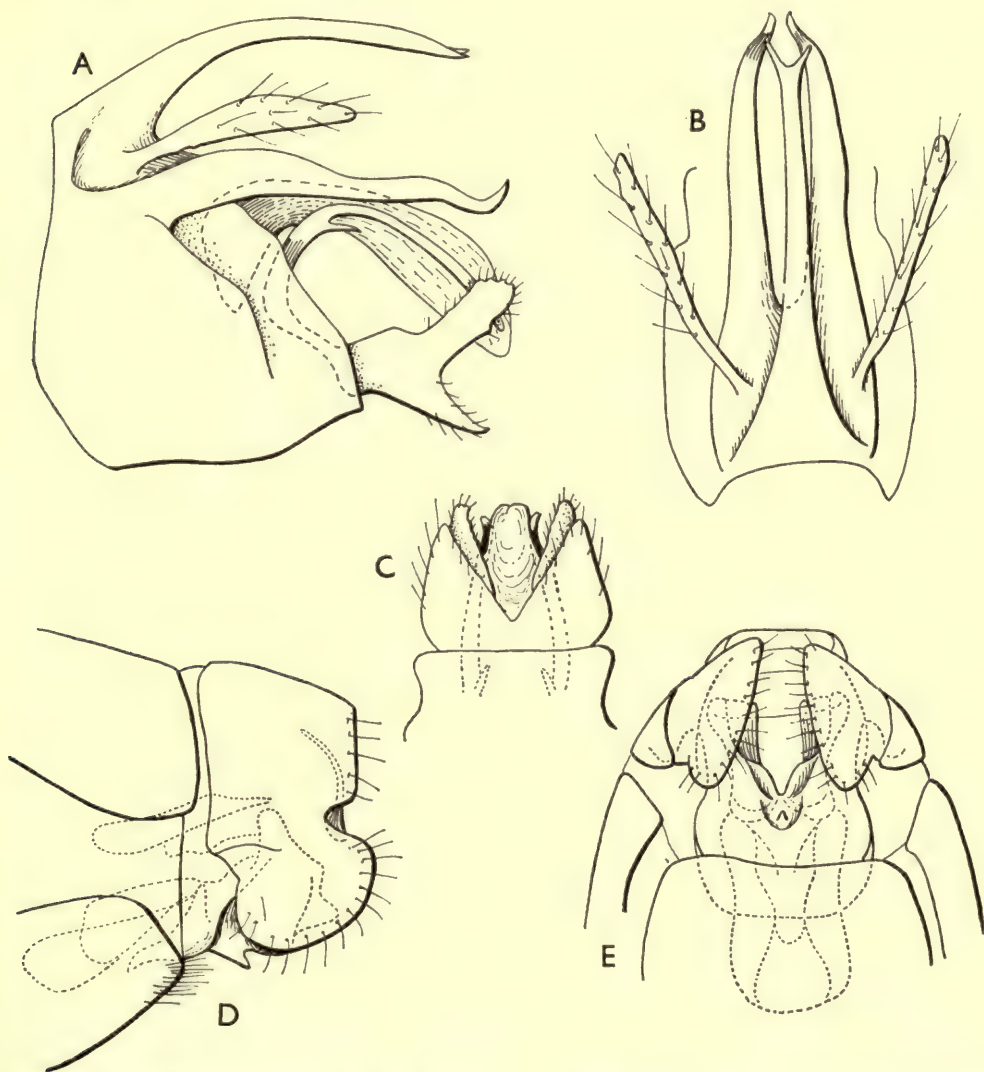


FIG. 67. *Triaenodes ustulata* sp. n. Genitalia. A, ♂, lateral; B, ♂, ninth and tenth tergites, dorsal; C, ♂, ninth segment, claspers and aedeagus, ventral; D, ♀, lateral; E, ♀, ventral.

Triadenodes sp.

In addition to the specimens of *Triadenodes* described in this paper, Miss Cheesman's collection contains a further eighteen females from Kokoda, two from Mt. Cyclops and one from Mt. Tafa. These cannot be associated with any of the previous species and they are left therefore as *Triadenodes* spp. ♀.

Adicella pulcherrima Ulmer

DUTCH NEW GUINEA: Cyclops Mts., Mt. Lina, 3,500–4,500 ft., iii. 1936, 2 ♂.
Previously recorded from Java and Sumatra.

Setodes niveolineata sp. n.

(Text-figs. 68A, 69)

PAPUA: Kokoda, 1,200 ft., vi–ix. 1933, 6 ♂, 9 ♀.

Head fuscous, with fuscous and broadened, snow-white hairs, the latter forming three longitudinal lines on the vertex, the lateral ones diverging from the antennal bases to the back of the

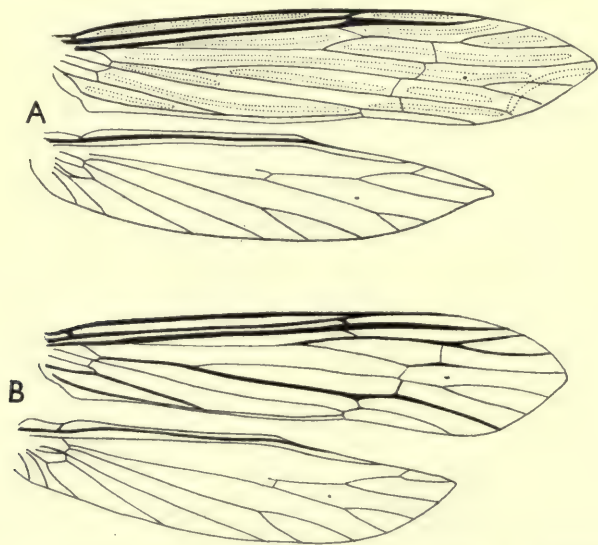


FIG. 68. *Setodes* spp. n. Wings. A, *niveolineata*; B, *papuana*.

head. Antennae snow-white beneath, pale luteous above, with faint fuscous annulations; basal segment with fuscous and whitish pubescence. Palpi with fuscous and greyish pubescence. Thorax fuscous, dorsally with four longitudinal lines of broadened, snow-white hairs, the outer ones being continued, when the wings are closed, by a line of similar hairs in the anal area of the fore wing. Legs fulvous, with fuscous pubescence, anterior femur and tibia with white pubescence externally, anterior tarsus snow-white dorsally, articulations fuscous. Fore wing densely clothed with reddish brown pubescence, most of the cells with narrow, longitudinal streaks of broadened,

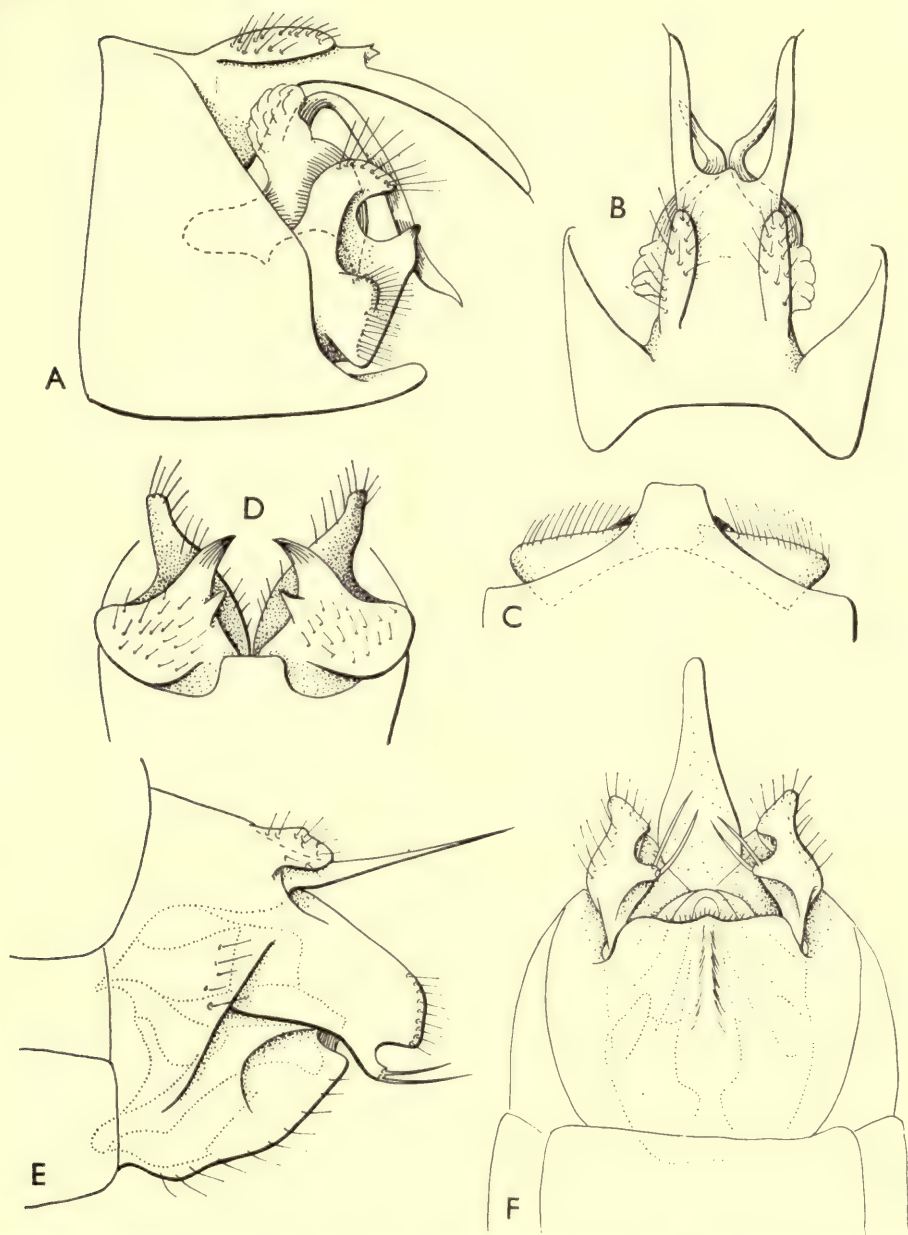


FIG. 69. *Setodes niveolineata* sp. n. Genitalia. A, ♂, lateral; B, ♂, ninth and tenth tergites and parameres, dorsal; C, ♂, ninth sternite and claspers, ventral; D, ♂, the same, from behind; E, ♀, lateral; F, ♀, ventral.

snow-white hairs, the streaks being margined with fuscous pubescence. There is an arched white streak, similarly bordered with fuscous, just behind the apex of the wing. Hind wing only sparsely clothed with fuscous pubescence.

♂ GENITALIA. Ninth segment narrowed dorsally, where it is fused with the tenth. Apical margin of ninth sternite produced at its centre in a narrow, truncate lobe, the apical margin on either side being widely concave. Tenth segment at base about half as wide as ninth segment, forming a hood, whose apical angles are extended downwards as curved spines, which are about as long as the tenth segment. Cerci short, digitate. Aedeagus short and arched in side view, apex acute. From behind, the apex is at first parallel-sided, then tapering to an acute apex. From the upper margin of the aedeagus, about midway, arises a pair of strong, sinuous, spiniform parameres, converging and then diverging in dorsal view. Clasper deep and broad at base, two-branched. In side view, the upper branch is separated from the lower by a short, rounded excision and is directed upwards and then caudad. From behind, it diverges and tapers to a narrow, truncate apex. The lower branch is bluntly triangular in side view and, when viewed from behind, tapers to a strong, acute spur, with a smaller spur about half-way along its inner margin.

♀ GENITALIA. Ninth segment more or less synscleritous, tenth tergite fused with it. The latter forms a long, spatulate lobe, very thin in side view, tapering to a rounded apex in dorsal view. Cerci short, flattened. Lateral gonapophyses about as long as ninth segment, apical margin excised at its lower corner to make a small, digitate process bearing one or two strong, apical setae. Ninth sternite broad, apical margin sinuous. There is a longitudinal, median carina in the apical half of the sternite. Bursa copulatrix strongly sclerotized.

Length of fore wing, ♂, 5.6-6.2 mm., ♀, 4.7-5.4 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, with abdomen cleared and in glycerine, paratypes pinned. The markings of the fore wing somewhat resemble those of the African species, *Hemileptocerus gregarius* Ulmer and *H. hargreavesi* (Ulmer), but both the male and female genitalia follow the pattern of *Setodes unispina* Martynov (India). In the male, there is a similar tenth segment, terminating in two spines, there are two spiniform parameres and the claspers are bilobed, though less complex than in *niveolineata*. In the female, the tenth tergite is also long, and the lateral gonapophyses are similarly formed. Martynov's specimens were in alcohol and no wing pattern was visible.

Setodes papuana sp. n.

(Text-figs. 68B, 70, 71)

PAPUA: Kokoda, 1,200 ft., v-ix. 1933, 19 ♂, 11 ♀.

Head yellowish, with golden pubescence, in unrubbed examples with four narrow, longitudinal bands of broadened, pearly white hairs. Antennae luteous, most of the segments banded apically with fuscous, basal segment unmarked. Palpi yellowish. Thorax yellowish, also with four pearly white lines in unrubbed specimens. Legs yellowish. Fore wing densely clothed with golden yellow pubescence and with rows of small spots formed of pearly white hairs. Hind wing with sparse fuscous pubescence.

♂ GENITALIA. Ninth and tenth tergites fused to form a hood-like dorsal plate. In dorsal view it is broad at its base, tapering to a rounded apex, about half as wide as base, and with a minute median excision. Cerci fused to dorsal surface of tenth segment, appearing as broad, shallow, setiferous warts. Aedeagus narrow and arched, apex somewhat membranous and bearing four minute spines. From its base arise a pair of long, slender, spiniform parameres, arching above the aedeagus and exceeding it in length. Clasper in side view slightly upcurved and tapering towards the apex, which is acute and hooked. Between the claspers, and arising

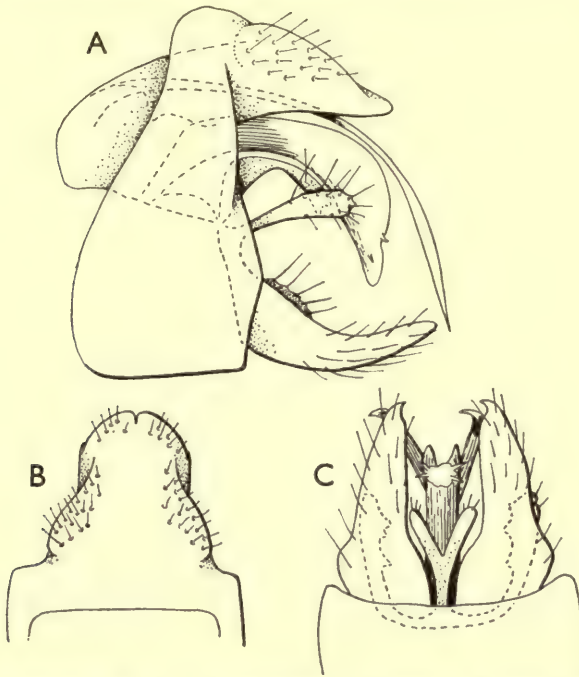


FIG. 70. *Setodes papuana* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth sternite, claspers and aedeagus, ventral.

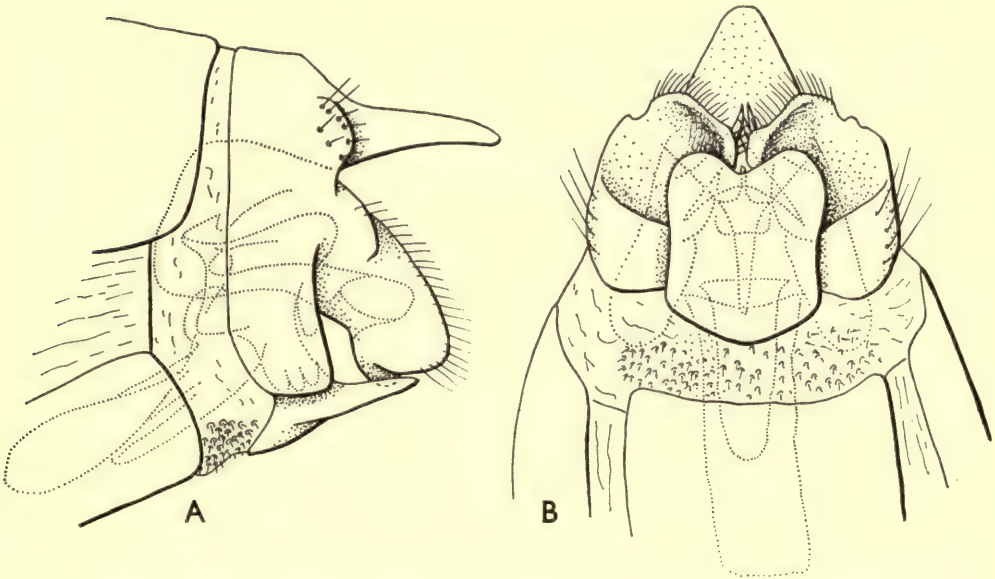


FIG. 71. *Setodes papuana* sp. n. ♀ Genitalia. A, lateral; B, ventral.

from their fused bases is a slender, bifurcate structure, situated beneath the aedeagus, and no doubt representing partly-fused second basal branches.

♀ GENITALIA. Ninth and tenth tergites fused, the tenth projecting in a triangular lobe with rounded apex in ventral view, appearing as a tapering finger in side view. Cerci reduced to short, setiferous warts, one on each side of the tenth segment. Ninth sternite forming a projecting subgenital plate, thin and roughly quadrate in ventral view, apical margin bilobed, basal margin convex. Lateral gonapophyses stout, downcurved, reniform in side view, apices almost meeting ventrally and armed with strong setae. The ventral membrane between the eighth and ninth sternites clothed with numerous setae. Bursa copulatrix complex and obscure.

Length of fore wing, ♂, ♀, 5-6 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, with abdomen cleared and in glycerine, paratypes pinned. This species resembles *S. argentifera* McLachlan (India) in the pattern of the fore wings and in the male genitalia. The aedeagus of *papuana* is shorter than the parameres and the claspers have only two basal branches (one pair partly fused basally) instead of three.

Family LEPIDOSTOMATIDAE

Dinarthropsis picea Ulmer

DUTCH NEW GUINEA: Cyclops Mts., Mt. Lina, 3,500-4,500 ft., iii. 1936, 2 ♂.
Previously recorded from Java.

Goerodes japonensis sp. n.

(Text-figs. 72-74)

DUTCH NEW GUINEA: Japen Island, Mt. Eiori, 2,000 ft., ix. 1938, 2 ♂, 7 ♀.

♂. Both males have been affected by moisture and are somewhat bedraggled and the type had a coating of mould. The general coloration is tawny yellow. Spurs 2.4.4. Antennae with a long basal segment, in frontal view with the inner surface convex and densely fringed with long, fine setae. Maxillary palpi probably two-segmented, terminal segment about three times as long as basal, slender, tapering, directed upwards at right angles to the basal segment and heavily shrouded in long, fine, golden setae. Thorax and legs tawny.

Fore wing elongate. The costal margin is folded over at the base, covering the subcosta and radius, the fold gradually narrowing to the apex of the wing and with a long, dense fringe of pale setae. At the bases of the radial sector and media, the membrane is impressed to form a narrow pouch, filled with orange scales, which projects on the under surface of the wing like a semi-ovate purse. Beyond this pouch, the membrane is doubled over on itself to make a long medio-cubital fold or groove, almost reaching to the apical margin. This fold is lined with scale-hairs and the veins anterior to it bear similar broadened hairs. The fold obscures the venation between R_5 and Cu_2 , the area between Cu_2 and the anal fold wide. The cells R_2 and R_4 are about half the length of the fore wing. Hind wing sparsely pubescent, discoidal cell open, R_2 and R_3 fused, cell R_4 present, more than half as long as wing.

♀. The females have also been affected by dampness. The general colour is rather darker than the males. Antenna with a long basal segment, but not unusually heavily fringed. In the fore wing, forks R_2 , R_4 , M_1 and Cu_{1a} present, the first three more than one-third the length of the wing. In the hind wing, forks R_2 , R_4 and Cu_{1a} present, discoidal cell present.

♂ GENITALIA. Ninth segment short. Tenth segment fused to it, obscurely quadrifid, the two inner branches reduced to small, triangular lobes with an excision between them. Outer branches

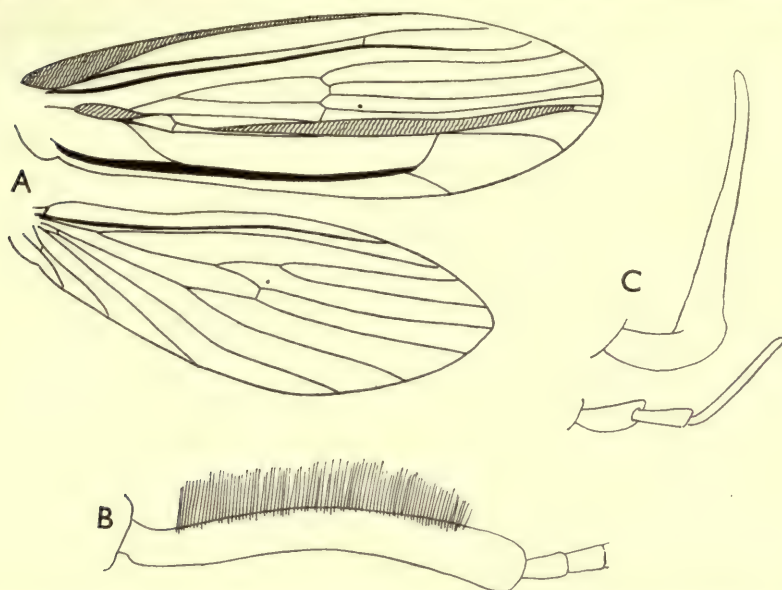


FIG. 72. *Goerodes japonensis* sp. n. ♂. A, wings; B, basal segment of right antenna; C, palpi, lateral.

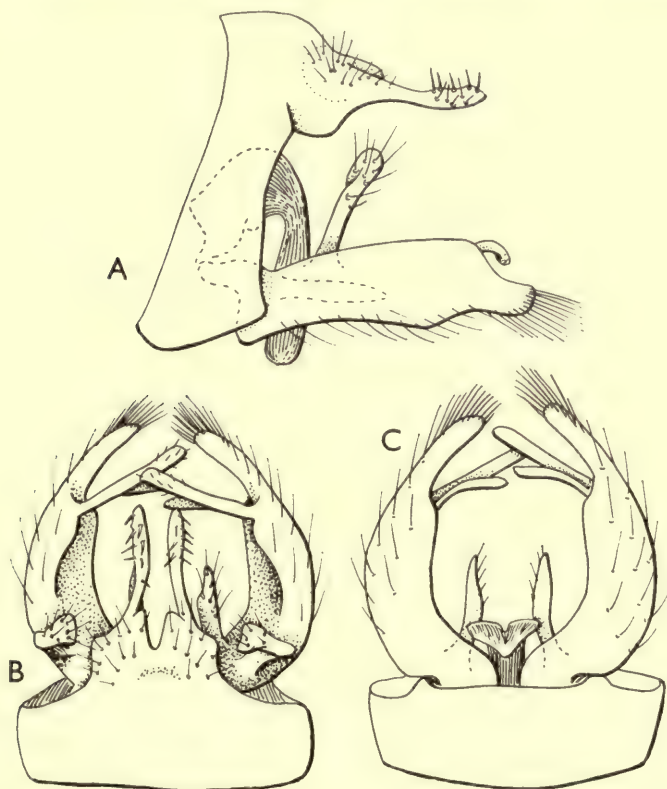


FIG. 73. *Goerodes japonensis* sp. n. ♂ Genitalia. A, lateral; B, dorsal; C, ventral.

long, slender, apices slightly dilated and bearing long setae. Aedeagus strongly arched downwards. Clasper strong, incurved, about four times as long as wide, constricted in its apical third to a finger terminating in a bunch of stout setae. Each clasper carries four branches. There is a slender branch arising from the inner basal margin, directed caudad. At about one-third from the base arises the usual, erect, incurved branch and at the level of the apical constriction are two more branches, slender and incurved, the uppermost the longer.

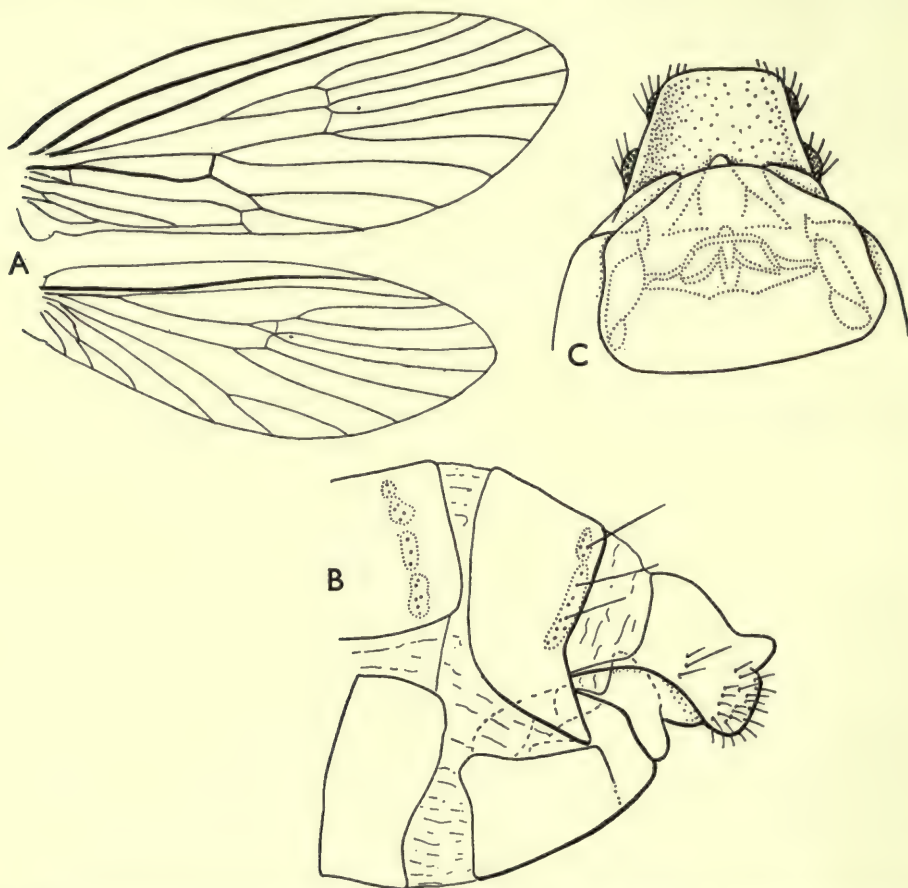


FIG. 74. *Goerodes japonensis* sp. n. ♀. A, wings; B, genitalia, lateral; C, the same, ventral.

♀ GENITALIA. Eighth tergite with lateral angles triangularly produced. Eighth sternite lightly sclerotized, forming a broad subgenital plate with a convex apical margin. Ninth and tenth tergites fused to make a broad hood, apical margin elevated in a pair of rounded projections. Lateral gonapophyses short and deep, rounded. Bursa copulatrix short and rounded.

Length of fore wing, ♂, ♀, 8 mm.

♂ HOLOTYPE, ♀ allotype mounted as microscope preparations, paratypes pinned. The male genitalia of this specimen are quite typical of the genus *Goerodes*, as defined by Mosely. In wing venation, the male differs somewhat from at least the majority

of the described species in the absence of a closed discoidal cell in the hind wing (although this may be an aberration) and in the presence in the fore wing of a distinct fold or groove in the medio-cubital area.

Lepidostomatidae ♀♀

DUTCH NEW GUINEA: Mt. Cyclops, 3,500 ft., iii. 1936, 7 ♀.

These females cannot be associated with *Dinarthropsis picea* Ulmer, since there is a closed discoidal cell in the hind wing.

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A KEY TO THE SPECIES OF
ACTORNITHOPHILUS FERRIS
WITH NOTES AND DESCRIPTIONS
OF NEW SPECIES

THERESA CLAY



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THERESA CLAY *xx*
British Museum (Natural History)



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A KEY TO THE SPECIES OF *ACTORNITHOPHILUS* FERRIS WITH NOTES AND DESCRIPTIONS OF NEW SPECIES

By THERESA CLAY

SYNOPSIS

The characters of the genus *Actornithophilus*, its possible subgenera and the generic position of *Colpocephalum pediculoides* Mjöberg are discussed. Intra-specific variation and the characters which may be of phylogenetic and taxonomic importance are considered. A short account of the host-parasite relationships is given. The species, subspecies and local populations are discussed with special reference to the relation between size of the individuals in populations from related hosts. Notes are given on some of the species-groups comprising the genus; seven new species are described and three neotypes and five lectotypes designated; notes are given on the interpretation of some names. There is a key to the species, a glossary of terms used and a list of the species of *Actornithophilus* parasitic on the Charadriiformes.

INTRODUCTION

TIMMERMANN (1954 and 1957) has published a survey of the species of *Actornithophilus* in the British Museum (Natural History), and it has now been thought useful to publish a key for their identification.

The examination of a greater number of species and a better understanding of the characters of the Menoponidae has shown that "A Preliminary Key to the Genera of Menoponidae" (Clay, 1947) is unsatisfactory in a number of points, especially couplets 42-47 which include *Longimenopon* (referred to as "New genus F") and *Actornithophilus*. Emerson (1956) has rediscovered the interesting species *Colpocephalum pediculoides* Mjöberg, 1910, from the type host *Arenaria interpres* and since then Major W. W. A. Phillips has collected a good series from the same host in Ceylon, and recently some specimens from this host collected in Saudi Arabia have been found in the Meinertzhagen collection in the British Museum. Emerson discusses the generic position of this species and shows that it is somewhat intermediate between *Longimenopon* and *Actornithophilus* and decides on the characters of the head and the sparse abdominal chaetotaxy to place it in *Longimenopon*. The present writer, since examining better preserved material of *Longimenopon* and of *pediculoides* and comparing the latter with *Actornithophilus erinaceus* Timmermann (Text-fig. 13 and Timmermann, 1954, pl. 26, fig. b) and *A. sabulosus* sp. n. considers that the degree of the expansion of the head, the form of the pre-ocular notch and the density of the abdominal chaetotaxy, cannot be used as generic

characters in *Actornithophilus*. The characters of the dorso-lateral margin of the head and the position of the eyes in the available material of *Longimenopon* from the Procellariiformes appear to differ from those of *pediculoides* and of any of the species of *Actornithophilus*. The fact that *pediculoides* has a marked brush of setae on sternum IV, characteristic of *Actornithophilus* but not of *Longimenopon*, shows that this species, together with *sabulosus* sp. n., should be included in *Actornithophilus*. It may prove, however, that *Longimenopon* is not generically separable from *Actornithophilus* (see Timmermann, 1957 : 110). It is possible that these species with elongated heads and elongated, poorly sclerotized abdomens without well-marked pleural thickening and, in some species at least, extremely brittle setae, such as *Somaphantus lusus* Paine, *Longimenopon* spp., *Actornithophilus pediculoides* (Mjöberg) **comb. n.** and *Rediella mirabilis* Hopkins live inside the quill feathers. This would account for their rarity in collections and for certain characters which they have in common. *Somaphantus spencei* Emerson, which has the characters listed above, was found in the quill feathers of a peacock, and *Actornithophilus patellatus* (Piaget), also with these characters, lives in the quills of the curlew. Presumably their tubular form and soft and flexible abdomen is associated with having to pass through the hole which they make in the quill.

ACTORNITHOPHILUS Ferris, 1916

Actornithophilus Ferris, 1916. *Canad. Ent.* **48** : 303. Type species *Colpocephalum uniseriatum* Piaget.

Diactornithophilus Balát, 1953. *Zool. ent. Listy*, **2** : 96, 104. Type species : *Actornithophilus svobodai* Balát (= *svobodae* Balát).

Clypeodon Timmermann, 1954. *Ann. Mag. nat. Hist.* (12) **7** : 830. Type species : *Colpocephalum incisum* Piaget. **Syn. n.**

Menoponidae without sclerotized processes ("oral spines") arising near base of maxillary palpi and without combs of spine-like setae on the venter of the third femora or any of the abdominal sterna. Antennal fossae never deep; preocular notch present, never a narrow preocular slit; position of eyes normal; gular plate and setae present. Ends of temples square or flatly rounded. Pro-, meso-, and metasternal plates developed; two to three prosternal setae; mesosternal plate with one or more central setae. Mesothorax well defined dorsally with the four anterior mesothoracic setae not lying close together in one group, the outer seta each side is sometimes larger than the central ones (Text-fig. 16). Third femora and abdominal sternum IV with thick or sparse brushes, sterna III and V may also have brushes but always less well developed than those on IV. On abdominal tergites I-VIII the post-spiracular seta is the first seta at each end of the posterior marginal row.

At the present time it is difficult to suggest the affinities of many of the genera of the Menoponidae. In the case of *Actornithophilus*, all that can be said is that in the general characters of the head, the presence in some species of sexual dimorphism of the anterior setae of the head and in the sterna of the thorax, *Actornithophilus* resembles the *Colpocephalum* group; it differs in the arrangement of the anterior mesothoracic setae and the absence of combs of spine-like setae.

Species of *Actornithophilus* are known to parasitize representatives of all the families of the suborder Charadrii (*sens.* Peters, 1934) with the exception of the Jacanidae and Thinocoridae, and of all the suborder Lari with the exception of the Stercorariidae and Rynchopidae from which there are no authentic records. The only species (*A. perplanus*) taken from a member of the suborder Alcae was based on a single specimen and proves to belong to the *ochraceus* group; it was probably a straggler from *Pluvialis* or *Squatarola* (see below, p. 232). Timmermann (1954) has separated generically under *Clypeodon* the species *incisus* Piaget, *ceruleus* Timmermann and *pacificus* Timmermann, the latter name being a synonym of *incisus* (see below, p. 202). There is a possibility that both *incisus* and *ceruleus* are found on the Sterninae genus *Anous* (see below, p. 201). If this is the case the genus *Clypeodon* would be restricted to the species parasitizing this genus, while the species on the rest of the suborder Lari would be included in *Actornithophilus*. The *Clypeodon* group is distinguished by the sexually dimorphic setae of the head, an exaggeration of a character found in some species of *Actornithophilus* from the Charadrii, by differences in the male genitalia, the characters of which are not usually useful generic criteria, and by the sexual dimorphism in the shape of the head; on these characters the females are not generically separable. However, the characters given in the first couplet of the following key, common to the species found on the suborder Lari and serving to separate them from the species found on the Charadrii, may prove to be of greater phylogenetic importance. If this is the case then either the species from the Larinae and the rest of the Sterninae must also be included in *Clypeodon* or placed in another new genus, as they are more closely related to *Clypeodon* than they are to *Actornithophilus*, or alternatively all the species can be included in *Actornithophilus*. This latter solution will be adopted here.

Balát (1953) divided the species of *Actornithophilus* into two subgenera based on the chaetotaxy of the tergites, placing those with one or more rows of anterior setae in his new subgenus *Diactornithophilus*, type species *D. svobodai* Balát = *gracilis* Piaget from *Vanellus vanellus*. As shown below, the abdominal tergites of different specimens of one species may have no anterior setae, one or two on a segment, or a well-marked row, even within a population from one host individual. This division would also separate generically the *ochraceus* and *hoplopteri* groups which resemble each other in other characters. It does not therefore seem possible to recognize *Diactornithophilus* even as a subgenus.

VARIATION. It may be said at once that it is not possible to make a key which will identify every specimen of *Actornithophilus* correctly. Differences between species are largely based on chaetotaxy and there may be specimens which are abnormal in this character. An extreme example is a specimen found in a collection of *Actornithophilus* from *Vanellus vanellus* sent by Dr. Balát which is unlike any other known *Actornithophilus* in having the metanotum thickly covered with setae and extra setae on the dorsum of the temples; it differs from typical *gracilis* in having many more tergal setae. However, the form of the preocular nodi, the shape and size of the head and other characters suggest that this is a specimen of *gracilis* with abnormal chaetotaxy. In those species (example: *A. totani*) in which the

tergal chaetotaxy of the male is heavy, there may be considerable individual variation in the density of the anterior tergal setae. Specimens of *A. hoplopteri* s. l. usually have most of the tergites with some anterior setae, but within a given population there may be specimens with setae and others with none, and populations from some hosts rarely or never have anterior setae. Other examples are males of *sedes* and females of *uniseriatus* which may have no anterior tergal setae, a few, or a well-marked row on some tergites. The relative lengths of the post-spiracular setae may be useful taxonomic characters (Text-fig. 72), but show some individual variation; another useful taxonomic character is the presence or absence of anterior tergal setae on the last segment of the abdomen, but occasionally in the female a specimen may differ from the majority of the population in this character, for example one female of *limosae* has been found without these setae and one of *pustulosus* with them. Other characters which show individual variation are: (i) in the *ochraceus* group the relative lengths of dorsal head setae a and b and whether a is spiniform; (ii) the presence of a long central prosternal seta: this is always present in *patellatus* and *pediculoides* (Text-fig. 17) but in some species especially in the *umbrinus* group it is present only in an occasional specimen; (iii) the number and position of the ventral setae on the last segment of the male abdomen; (iv) the male genital sclerite which may show variation in the extent of the anterior division, although the junction of the sclerite to the sac may be a useful taxonomic character.

CHARACTERS OF PHYLOGENETIC AND TAXONOMIC IMPORTANCE. Keys, although useful as a method of delimiting populations into definable taxa and encouraging the study of individual variation in the search for constant specific characters, may give a false idea of relationships as useful key characters are not necessarily of phylogenetic importance (see also Bigelow, 1958). In *Actornithophilus*, in which the type of abdominal chaetotaxy gives such a distinctive appearance to the species and is useful taxonomically, the characters of possible phylogenetic importance may be overlooked. Thus, the populations from some species of *Tringa* resemble the rest of the *umbrinus* group from the Scolopacidae in the general appearance of the abdominal chaetotaxy while those from other species resemble some of the *hoplopteri* group from the Charadriidae. As it is the general rule for the Mallophaga parasitizing related¹ hosts to be themselves related, it seems reasonable to consider the characters common to populations from related hosts as ones of possible phylogenetic importance, although of course some of these may be directly adaptive and convergent in origin (see also Clay, 1951: 173). Balát (1953: 15) bases his subgenus *Diactornithophilus* on the number of rows of tergal setae, and thus includes the populations from *Vanellus*, *Tringa*, *Philomachus*, *Limosa*, *Calidris*; here also would have to go the populations from *Hoplopterus* and some other genera of the Vanellinae (sens. Peters, 1934). However, if the populations from this latter subfamily are considered together, a number of characters (see p. 202) can be found which are common to all the populations, and which separate them from the

¹ "Related" as applied to a group of taxa is used in the generally accepted sense that these taxa have a number of characters in common which separate them as a distinct group, whether or not some of the included taxa may actually be phylogenetically more closely related to other less similar taxa.

populations found on most of the Charadriinae (*sens.* Peters) and those from other host groups, and which are possibly less directly associated with the habitat provided by the feathers of the bird than is the abdominal chaetotaxy. Not all the host genera and species are parasitized by the species-group of *Actornithophilus* which would be expected from their generally accepted classification, but there are sufficient cases to make it possible to apply this method and to enumerate the characters which probably show relationship within the genus. These are: length of seta at base of labial palp, presence or absence of head sensillus 4 and dorsal head seta *d*, number of mesosternal setae (whether one or three or more), size of the preocular occipital and thoracic nodi, size of the marginal setae of the prothorax and metathorax (although there is a tendency towards individual variation here) and sometimes the form of the pleural thickening. Also sometimes the abdominal tergal chaetotaxy.

Characters which may be useful for the separation of species but do not necessarily show wider relationships are: the form of the dorso-lateral margin of the head; size of dorsal head setae *a*, *e* and *f*, and dorsal prothoracic seta *1*; the degree of development of the hypopharyngeal sclerite; the form of the prosternal plate and whether it surrounds the prosternal setae; the presence or absence of long anterior setae on the metanotum and anterior dorsal setae on the last abdominal segment; the number of tibial setae; the relative length and thickness of the post-spiracular setae; the setal pattern on the margins of the tergites; the number of rows and size of the anterior tergal setae; the number of inner posterior setae on the last segment of the female abdomen; the degree of development of the internal anterior processes of the tergites and the internal pleural thickening; and the form of the sclerite in the genital sac. The number and arrangement of the setae of the legs are fairly constant throughout the genus; differences are found in the size of the three setae at the distal end of the ventral surface of tibiae II–III, at least one of which is stout and spine-like, and in the number of setae along the outer lateral margins of tibiae I–III. On tibiae II and III there are usually two long and one or two short outer latero-ventral setae (Text-fig. 52), and a number of outer latero-dorsal setae, the two most distal of which are not included in the counts (Text-fig. 51). In *A. incisus*, *A. ceruleus*, *A. piceus* and *A. lari* the first outer latero-ventral seta is shorter and finer than in other species of *Actornithophilus* and in *A. tetralicis* sp. n. there are one to two extra latero-ventral setae (Text-fig. 54), and the outer latero-dorsal setae of tibiae II–III are more numerous. These differences may not always be obvious when the leg is distorted in some way during mounting. There are other minor characters which appear in the key, and of course there may be others which have been overlooked.

One of the most useful characters is the setal pattern on the margins of the tergites. Setal pattern A (see glossary) is found on the margin of the metathorax of all species from the Charadrii with the exception of most specimens of *grandiceps*, and on the abdominal tergites of certain groups. Even in those males in which there are more numerous marginal setae, there may be six stouter and longer setae which probably represent the six central setae of pattern A and in these species the females have setal pattern A, at least on tergite VIII; this suggests that it may be the primitive setal

pattern of *Actornithophilus*. In the species where the males have setal pattern A, the females usually have the modified pattern A.1 (see glossary) on tergite VIII. When considering the possible phylogenetic relationships within the genus, this setal pattern may be important (see also Timmermann, 1957). If pattern A is the more primitive one, from which the denser chaetotaxy has been developed more than once, it would explain the apparent similarity of certain species from unrelated hosts. Thus all the known populations parasitic on the Charadriidae (*sens.* Peters, 1934) have setal pattern A on segments I–VII. They are also characterized by the large size of the preocular, occipital and thoracic nodi. Rather similar species are found on the Recurvirostrinae, *Glareola* and *Pluvianus* (family Glareolidae) and *Chionis* (family Chionidae). Whereas both the species from *Pluvianus* (*A. hoplopteri sens. lat.*) and *Chionis* (*A. pauliani*) seem to be genuinely related to *A. hoplopteri* and are perhaps fairly recent acquisitions from another host, the species from the Recurvirostrinae differ in a number of characters (see below, p. 208) and their apparent similarity to the *ochraceus* group may merely be due to the retention of certain primitive characters. This also may be the case with the species *A. sedes* from *Glareola*.

HOST-PARASITE RELATIONSHIPS. In considering the phylogeny and host relationships of *Actornithophilus* it is important to bear in mind the possibility that there may have been natural straggling of a temporary nature, natural straggling followed by establishment on the new host, or contamination during collecting. The species of *Actornithophilus* are fast runners and often leave the dead host when this is handled. They appear also to leave the host during incubation. Thompson (1936 : 94) and Eichler (1946 : 5) give records of species being found on eggs of waders. On some waders *Actornithophilus* is rare and the absence of competition may have made the establishment of a straggling species easier. It is possible that species with the simple setal pattern could have established themselves on a new host, the more complicated setal pattern of the species found on the Erolinae, for instance, perhaps being a special adaptation to the feathers of the hosts. There is also the possibility that there may have been some hybridization between populations, especially those of the *ochraceus* group (perhaps made possible by the simple setal pattern) which might account for the variation within populations and the difficulty of their systematics. Hybridization in the Mallophaga is of course different from that between free-living geographical subspecies where hybridization takes place between adjacent subspecies which are the most nearly related, whereas in the Mallophaga the two forms come into contact due to fortuitous straggling between hosts which happen to be nesting in close proximity.

At the present time, the material from some host species is meagre, sometimes only a few specimens from one host individual, making it impossible to judge the amount of variation or the possibility of contamination or natural straggling. Host-parasite relations must therefore be evaluated with circumspection due to the difficulty of deciding which characters are of phylogenetic importance, and because of the possibility of secondary infestations followed by some divergence or even the possibility of hybridization between the original and immigrant population. Below (p. 200) is given a method by which it may sometimes be possible to distinguish

between true and apparent relationships of populations and to deduce cases of secondary infestations. Taking all these possibilities into account, it may be of interest to see how far distribution of *Actornithophilus* follows the classification of their hosts as arranged by Peters (1934) (see also Timmermann, 1957). The family Charadriidae are parasitized by species of the *ochraceus-hoplopteri* group. Within this family the genus *Vanellus* has a distinct species, while the rest of the subfamily Vanellinae are with two exceptions (see below) parasitized by populations which can all be included in *hoplopteri sens. lat.* The subfamily Charadriinae are all, with the exception of *Charadrius vociferus* (possibly a case of secondary infestation, see below, p. 200) parasitized by populations of *ochraceus sens. lat.*, although *C. hiaticula semipalmatus* has a second species belonging to the *pediculoides* group (p. 228). This supports Peters (1934) and the classification of Bock (1958 : 56) that all the genera of the Charadriidae form a related group with a gap between the Vanellinae *sens. Peters* and the Charadriinae ; and follows Bock's contention of the close relationship of the " genera " comprising the Charadriinae on one side and the Vanellinae on the other, but differs in suggesting that *Vanellus* is somewhat distinct from the rest of the Vanellinae. Also apparently genuinely related to the *ochraceus-hoplopteri* group are the populations from *Pluvianus* (Glareolidae) (possibly a secondary infestation, see below) and from *Chionis* (Chionidae) ; that from the Burhinidae, although distinct, has some similarity to the *hoplopteri* group and those from *Glareola* (Glareolidae) and the Recurvirostrinae are rather similar to the *ochraceus* group, but this may not be significant in terms of relationship (see above). The Scolopacidae are parasitized by members of the *umbrinus* group with the exception of *Arenaria* which has a distinct species and *Numenius arquatus* which has a quill-inhabiting species (see above, p. 192). The small amount of material from the Phalaropidae also belongs to the *umbrinus* group, but further confirmation that this is the true host is desirable. Within the *umbrinus* group, it does not seem possible at this stage to say which species are likely to be more closely related to each other with the exception of the related species on *Philomachus* and on the rest of the Erolinae. The *grandiceps* group found on *Haematopus* (Haematopodidae) and *Ibidorhyncha* (Recurvirostridae) is quite distinct from other species-groups ; the populations on the two hosts cannot satisfactorily be separated on present material. The Dromadidae and the Rostratulidae each have distinct species.

THE SPECIES, SUBSPECIES AND LOCAL POPULATIONS. These categories in the Mallophaga have been discussed elsewhere (Clay, 1958) with special reference to the ischnoceran genus *Degeeriella*. Johnson (1960) has also discussed the use of the subspecific category in the Mallophaga and Anoplura and suggests that as there is no information at present available on whether two populations can interbreed freely it is a purely subjective category and serves no useful purpose in the taxonomy of these groups. Although it seems that the subspecific category can be applied usefully, although arbitrarily, to some of the ischnoceran genera its application in the Amblycera is less satisfactory. Until more is known about the relationships between populations in this superfamily it is perhaps better not to make any use of the category.

In *Actornithophilus* there is the usual difficult and time-wasting problem of which

populations within a group of similar populations should be recognized nomenclatorially. In this genus, as in the majority of mallophagan genera where there are a number of related populations, those parasitizing the larger hosts tend to comprise larger individuals. Text-fig. 1 shows the relationship between the breadth of the head in the *ochraceus-hoplopteri* group and the wing length of their hosts. This can only be a rough approximation of the relation between size of host and parasite, as wing length is not always an index of general size. Also in most reference books only the observed range of wing measurements is given so it has been necessary to use Simpson's "crude mean" (1941), that is, the sum of the maximum and minimum measurements given divided by two. If there were available detailed measurements of feather parts of related species of birds which differ in size (see Rensch, quoted in Clay, 1951 : 209) it might be possible to make exact correlations between size of louse and size of host and perhaps to make more reliable and useful deductions. In the case of the parasite some of the populations are represented by rather small numbers (especially Nos. 1-4 and 7, Text-fig. 1), in a few cases single specimens, so that the exact position of the mark might be different if a larger number of measurements had been taken. But the diagram is sufficient to show the general association between size of host and parasite and also demonstrates how a population which does not fit into the general trend of such an association stands out and its true status can be given further consideration. Examples of such populations are those from *Pluvianus*, *Charadrius vociferus* and *Burhinus*. The populations from *Pluvianus aegyptius* (No. 5) cannot satisfactorily be separated morphologically from *A. hoplopteri* although the preocular nodus¹ is relatively smaller (Text-fig. 36). The individuals average larger than would be expected from the size of the host, but this discrepancy may partly be due to the fact that *Pluvianus* has rather shorter wings in relation to its body size than the species of *Charadrius* shown in the diagram. This relation between wing length and body size must always be considered when comparing host-parasite ratios. Even taking this into account, the average size of parasites is perhaps still larger than would be expected. *Pluvianus*, included in the Glareolidae by Peters (1934) is not considered to be related to the Vanellinae, to which the hosts of *hoplopteri* mostly belong, and the fact that it is parasitized by a population of this latter species, of which the individuals are larger than would be expected from the size of the bird, suggests the possibility that it is a rather recent acquisition from one of the African Vanellinae which are larger than *Pluvianus*.

The parasites of *Charadrius vociferus*, unlike those of all other known species of *Charadrius*, belong to *A. hoplopteri sens. lat.* They are the smallest in size of all known populations of *hoplopteri*, as would be expected from the size of the host, and relatively smaller than members of *ochraceus* from other species of *Charadrius*, but it is possible that the host-parasite size ratio of *ochraceus* and *hoplopteri* are different (there is a suggestion of this in the diagram). *A. hoplopteri* is probably found on *C. v. vociferus* throughout its range; specimens have been seen from British Columbia, Utah, Oklahoma, Texas and California. This, together with the host-parasite size ratio, suggests that if this is a case of secondary infestation the parasite must have been established on this host early in its history. The parasites of

¹ The exact shape of the preocular nodus is not of diagnostic value as there may be individual variation.

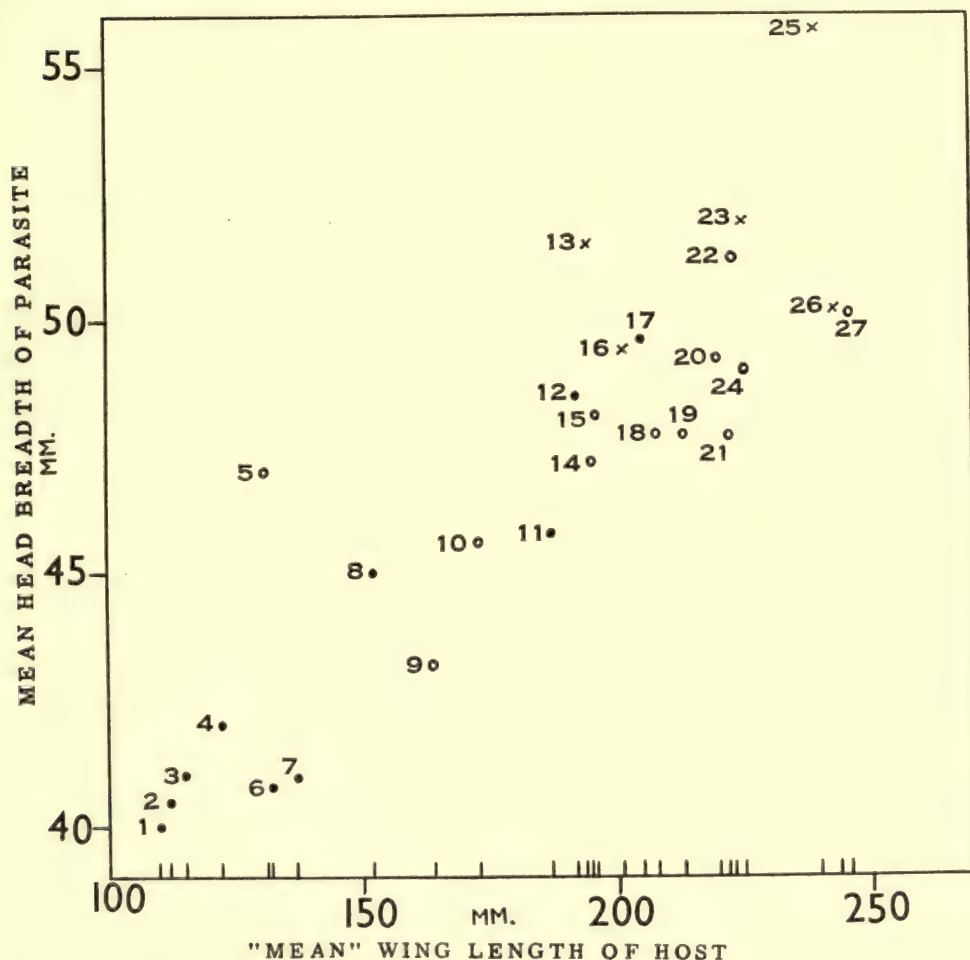


FIG. 1. Diagram illustrating relation between size of parasite and size of host. Numbers 1-27 host species (names according to Peters, 1934): 1. *Charadrius tricollaris*. 2. *Charadrius alexandrinus*. 3. *Charadrius dubius*. 4. *Charadrius mongolus*. 5. *Pluvianus aegyptius*. 6. *Charadrius hiaticula*. 7. *Charadrius leschenaultii*. 8. *Eudromias morinellus*. 9. *Charadrius vociferus*. 10. *Chettusia leucura*. 11. *Pluvialis apricaria*. 12. *Squatarola squatarola*. 13. *Glareola pratincola*. 14. *Hoplopterus duvaucelii*. 15. *Hoplopterus spinosus*. 16. *Stephanibyx coronatus*. 17. *Chettusia gregaria*. 18. *Hoplopterus armatus*. 19. *Xiphioidipterus albiceps*. 20. *Stephanibyx melanopterus*. 21. *Lobivanellus indicus*. 22. *Ptiloscelys resplendens*. 23. *Vanellus vanellus*. 24. *Afribyx senegallus*. 25. *Burhinus oedicnemus*. 26. *Chionis minor*. 27. *Lobibyx novaehollandiae*. ●—*Actornithophilus ochraceus* sens. lat. ○—*A. hoplopteri* sens. lat. ×—Other species of *Actornithophilus*. (Too many deductions should not be made from this diagram, see text.)

Burhinus (not included in the Charadriidae) average considerably larger than those from the Vanellinae and although similar to those of the *hoplopteri* group differ in a number of small characters, one of which is the size of the preocular nodi. In the *ochraceus-hoplopteri* groups this nodus either tends to increase in size with the size of the head, or remain relatively the same size, but in the population from *Burhinus* it is smaller than in some of the populations of *hoplopteri*, the heads of which average smaller (Text-figs. 33-40). These examples, even taking into account the unsatisfactory method of compiling the diagram, are sufficient to show that such diagrams may be used to bring to notice populations which are in some way anomalous and may either belong to distinct or not closely related species or be due to secondary infestation. It is possible to follow the character gradients and any population in which a character goes against the general trend of association with size of the parasite can be considered as being genetically more remote and should be examined for other character differences, as in the case of *A. tetralicis* sp. n. from *Burhinus*. Such a diagram may also be used to check whether specimens taken from a given host are likely to belong to the established population or to be temporary stragglers. Specimens from *Chettusia gregaria* (Text-figs. 1, 17), for instance, unlike those from *C. leucura* and most of the rest of the Vanellinae, belong to the species *A. ochraceus*. They are, however, larger (as is the host) than those from any of the Charadriinae, but fit into the general host-parasite size ratio of *ochraceus*. This suggests that these specimens are the established parasite of *C. leucura* and (if the population is the result of secondary infestation) that they have been established for a sufficient length of time to become adapted to their new host.

As in the *ochraceus-hoplopteri* groups the populations of *umbrinus* (see p. 210) show a relationship between the size of the parasite and that of the host; correlated with these size differences are differences in the shape of the head and chaetotaxy of the abdomen, but if the populations from many hosts are compared it is found to be impossible to separate them satisfactorily into taxonomic units. Elsewhere (Clay, in press) it has been suggested that when a number of populations are included under one name it is useful to show this by the addition of the term *sensu lato*. This added to the specific or subspecific name indicates that the specimens are from a population belonging to this taxon, restricted to a definite host form or forms and presumably with a distinct gene complex. The population may be separable from that from the type host of the taxon only statistically or there may be other populations showing intermediate characters making nomenclatorial recognition unsatisfactory. In the case of some of these populations future work may reveal valid characters for separation.

NOTE ON MEASUREMENTS

Measurements of total length and of breadth and length of the abdomen are unreliable in many of the Menoponidae as they are dependent on the amount of pressure exerted by the cover slip in mounting. These measurements are given for one individual in the case of the new species as a general indication of size. The length of the head is again an unreliable measurement owing to the fact that the head often does not lie flat under the cover slip and the occipital margin may be

distorted. The measurements least affected by distortion seem to be those of the breadth of the head at the temples (B.1) and at the preocular enlargement (B.2) and probably the breadth of the prothorax. Owing to the difficulty of finding measurable examples of post-spiracular setae the numbers on which Text-fig. 72 is based are small, but these reflect the differences between the relative lengths of the post-spiracular setae in the species represented. All specimens measured are mounted in Canada balsam.

TAXONOMIC NOTES AND DESCRIPTIONS OF NEW SPECIES

The *piceus* Species-group

The populations of *Actornithophilus* found on the Laridae have not been revised in detail, and must wait for a larger amount of material from more host species. In general, individuals from the Sterninae (i.e. *piceus* Denny) are smaller than those from the Larinae (i.e. *lari* Packard) :

Breadth at temples in mm.		
	♂	♀
<i>piceus</i>	0.61-0.67	0.67-0.73
<i>lari</i>	0.71-0.74	0.77-0.80

However, the measurements of one male out of nine taken from an individual of *Larus fuscus* fall within the range of those of typical *piceus* (b.1, for instance, is 0.65 mm.) and does not seem to be separable. Piaget's type of *A. fuscipes* (host : *Larus dominicanus*), a female, measures 0.76 mm. and a single female from *Gelochelidon nilotica* measures 0.77 mm., but the host record needs confirmation. No specimens have been seen from the smaller gulls and it may prove that there is no way of separating the populations from the different divisions of the Laridae ; they are here all included under the name *A. piceus* (Denny), *sens. lat.* Only one male has been seen from *Gygis alba* and the measurement of this specimen and those given for the female holotype of *A. candidus* Carriker, 1949, fall within the range of measurements given above for *piceus* ; the male from *Gygis* has a greater number of abdominal tergal setae especially on segment II, but without further material it is not possible to say whether this is individual variation or not. It seems from the description of *candida* that this may have been based on a teneral female.

Lectotype of *Colpocephalum piceum* Denny: ♀ (slide No. 1) in the Denny collection, British Museum (Natural History).

***Actornithophilus ceruleus* (Timmermann, 1954)**

A. ceruleus was described from five specimens taken from skins of two forms of *Procelsterna cerulea*. Three ♂, 1 ♀ from skins of *Anous minutus melanogenys* from the South Seas and 1 ♂, 1 ♀ (K. C. Emerson collection) from *Anous m. minutus* on Lolobau Island, Bismarck Archipelago appear to be inseparable from *A. ceruleus*. Although the specimens taken from skins without an exact locality must be treated

with some doubt it seems that the pair in the Emerson collection could not be the result of contamination between *Procelsterna* and *Anous* as according to Dr. H. G. Deignan of the United States National Museum the former genus is not known to occur in the Bismarck Archipelago. Therefore either *A. ceruleus* occurs on both *Procelsterna* and *Anous* or the host record of the type material is incorrect.

Actornithophilus pacificus (Timmermann, 1955)

This species was described from five specimens taken from skins of two species of *Puffinus* from three localities; the specimens are in poor condition but appear to be the same as *A. incisus* from *Anous stolidus*. Unless further material of this species is found to occur naturally on *Puffinus* it must be assumed that the type material originated from *Anous*.

The *ochraceus* and *hoplopteri* Species-groups

The species of these two groups have the following characters in common: the large size of the preocular, occipital and thoracic nodi, a tendency in the males to have dorsal head seta *a* spine-like (Text-fig. 4); marginal prothoracic seta 5 and metathoracic seta 2 short and fine, although in the occasional specimen these setae may be longer; tergites with well-developed internal anterior processes (Text-figs. 55 and 56); tergites I–VII with setal pattern A and VIII with pattern A.1; last segment in both sexes without dorsal anterior setae; post-spiracular setae V and usually III markedly shorter than II and IV. The males of the *hoplopteri* group can at once be distinguished by the form of the sclerite in the genital sac (Pl. 7, fig. 5). Other characters distinguishing the species of the two groups are the shape of the preocular nodus which usually has a straighter anterior margin in *hoplopteri* (but there is some variation), the longer somewhat finer tergal setae and the less well-marked colour pattern in *ochraceus*. *A. crinitus* sp. n. from *Stephanibyx coronatus* is somewhat intermediate between the two groups (see below). *A. gracilis* from *Vanellus vanellus* is a well-marked form resembling the *ochraceus* group in the character of the male genital sclerite but differing from all other species of the two groups in the presence of long anterior metanotal setae. Morphologically *A. sedes* appears to belong to the *ochraceus* group (see also above, p. 196).

The populations comprising *A. ochraceus* (Nitzsch) *sens. lat.* are found on the subfamily Charadriinae (*sens. Peters*, 1934) with the exception of *Charadrius vociferus* (see p. 198). *Chettusia gregaria*, although belonging to the subfamily Vanellinae, is parasitized by *ochraceus* (see p. 200). As discussed above and shown in the diagram (Text-fig. 1) there is a general correlation between the size of the louse and the size of its host. Those lice with heads narrower across the temples have a tendency towards relatively longer heads and rather less elongated preocular nodi (Text-figs. 25 and 26), so that when comparing the extremes of size such as in populations from *Charadrius tricollaris* and *Squatarola squatarola* there is considerable difference in appearance of the individuals. However, examination of populations from other hosts show that these characters grade into each other and cannot be used for satisfactory taxonomic divisions. Dorsal seta *a* of the head of the male

may or may not be spiniform (Text-fig. 4), but it has been found that even within a population from one host form specimens are found with or without spiniform setae, sometimes differing on two sides of the head. Considerable variation is also found in the length of seta *a* relative to the length of seta *b*. In view of the variation and character gradients it seems more satisfactory to include all these populations under the name *ochraceus*. Thus the following described forms are considered to be synonyms of *A. ochraceus* (Nitzsch, 1818) *s. l.*:

A. flavipes (Giebel), *A. timidus* (Kellogg), *A. perplanus* (Kellogg & Chapman), *A. perrarus* Blagoveshtchensky, *A. laveni* Eichler, **syn. n.**

The *hoplopteri* group comprises *A. hoplopteri s. l.* and *A. pauliani*. Within *A. hoplopteri s. l.* the anterior tergal setae may be absent or show considerable variation in number. In most of the populations at least some of the tergites have one or more anterior setae and some segments have a definite row, but there may be individuals without anterior setae on any of the segments. In the populations from *Lobivanellus*, *Hemiparra* and *Hoplopterus duvaucelli* no individuals with anterior tergal setae have been seen, and in this way they resemble individuals of the *ochraceus* group. This is obviously a variable character and not always useful for specific separation.

A. hoplopteri s. l. is found on the Vanellinae with the exception of *Stephanibyx coronatus* which has a distinct species (see below) and *Chettusia gregaria*, already discussed above. It is also found on *Pluvianus* (discussed above, p. 198). The diagram (Text-fig. 1, 5) shows the general correlation between size of parasite and host. No characters have been found which would usefully separate any of these populations taxonomically.

The population from *Chionis minor*, recognized here as a species (*A. pauliani*), is near *hoplopteri* although the hosts are placed in different superfamilies. The parasites fit into the general trend for size in relation to size of host (Text-figs. 1, 26), but the preocular nodi are relatively smaller (Text-figs. 33, 39). *A. pauliani* also differs by the prosternal plate not surrounding the prosternal setae; the tergal setae being somewhat longer than in typical *hoplopteri* (Pl. 7, figs. 1, 2) and postspiracular seta III not being markedly shorter than IV (Text-fig. 72).

***Actornithophilus ochraceus* (Nitzsch, 1818)**

Type host : *Pluvialis apricaria* (Linn.)

(Pl. 9, fig. 2; Pl. 10, fig. 3; Text-figs. 2, 25–28, 55–56, 63)

The history and type host of this species has been discussed in Clay & Hopkins (1960 : 45). It is distinguished from other species from the Charadrii by the form of the preocular, occipital and thoracic nodi, form of the prosternal plate, form of the marginal setae of the thorax, absence of long setae on the metanotum, the tergal setal pattern of the metathorax and abdomen, the relative lengths of the postspiracular setae, absence of anterior setae on any of the tergites, the internal processes of the tergites and the sclerite of the genital sac. The female has tergal pattern A on segments I–VII and A.1 on segment VIII; there are no anterior

dorsal setae on the last segment and the posterior sternites are of the type shown in Text-fig. 71.

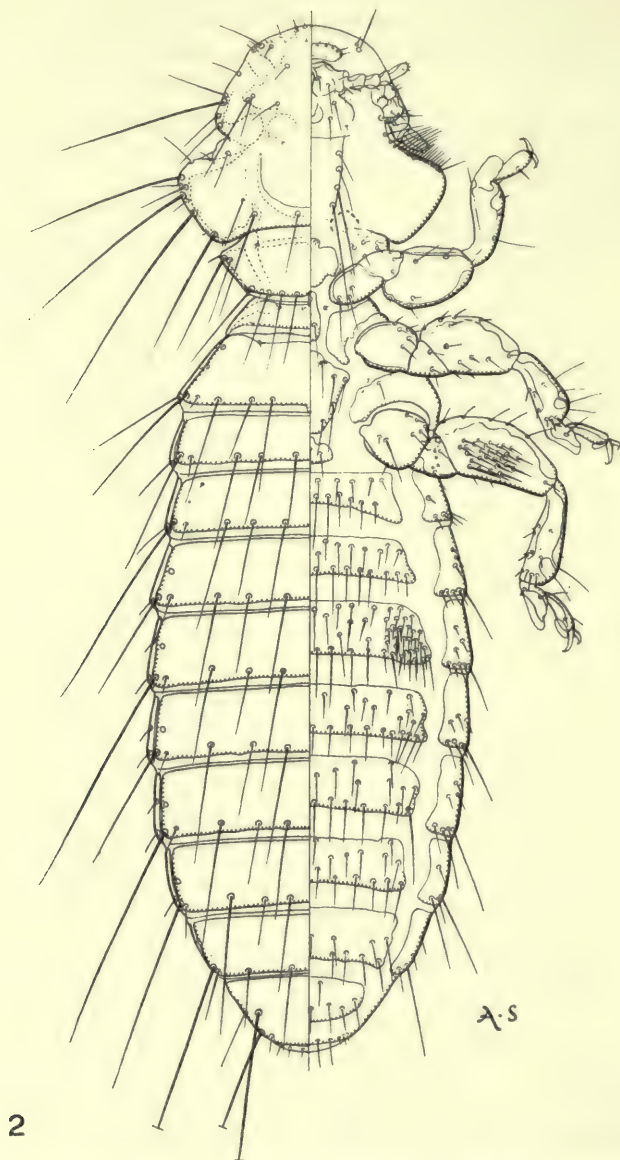


FIG. 2. *Actornithophilus ochraceus* (Nitzsch). Male from type host.

Neotype male and *neallotype* female of *Actornithophilus ochraceus* (Nitzsch, 1818) in the British Museum (Natural History), slide No. 16443a, from *Pluvialis apricaria* from Ireland, February, 1947.

Balát (1953 : 93) designated a male and a female as unofficial neotypes of this species ; however a neotype must be a single specimen so that it is necessary to re-designate the neotype before submitting an application to the International Commission on Zoological Nomenclature. Dr. Balát has most kindly presented to the British Museum (Natural History) the two specimens which he designated as neotypes. However, it has been decided not to use as neotype Dr. Balát's male specimen as this is exceptionally small for a specimen from *Pluvialis apricaria*. It is possible that the specimen is somewhat shrunk but even so its measurements fall within the range of those from the small species of *Charadrius* such as *C. hiaticula*. Dr. Balát says (in litt.) that there can be no doubt about the correct identification of the host as *apricaria* is the only species of *Charadrius* (*sens. lat.*) which comes to Czechoslovakia in December, the month in which the specimens were collected. It appears therefore that either these specimens of *Actornithophilus* are atypical or they are natural stragglers on the *apricarius* individuals from which they were collected. In either case they do not seem suitable type material and a specimen which is typical of the population from *Pluvialis* from various localities and which had already been drawn has been chosen as neotype.

Measurements in mm. of A. ochraceus from Pluvialis apricaria

	Male		Female	
	Length	Breadth	Length	Breadth
Head B.1	. 0.35	0.47	. 0.37	0.52
B.2	. —	0.35	. —	0.37
Prothorax	. —	0.32	. —	0.34
Metathorax	. —	0.43	. —	0.48
Abdomen	. 1.13	0.57	. 1.31	0.67
Total	. 1.78	—	. 2.00	—

Actornithophilus crinitus sp. n.

Type host : *Stephanibyx c. coronatus* (Boddaert)

(Pl. 4, fig. 1, Pl. 10, fig. 4 ; Text-figs. 4, 38, 50, 51, 52, 71)

This species is distinguished from all other species of *Actornithophilus* by the presence of at least three setae on both preocular enlargements. In general appearance it resembles *hoplopteri* from which it is separated by the characters of the prosternal plate and the sclerite of the genital sac, in addition to the head setae. If the type of genital sac (Pl. 10, fig. 3) found in *ochraceus* and other species of *Actornithophilus* is the more primitive form and therefore not of great phylogenetic importance, then it is probable that the affinities of *crinitus* lie with the *hoplopteri* group which it resembles closely in most of its characters ; the occasional specimen of *hoplopteri* and *ochraceus* may have three setae on the preocular enlargement on one side of the head.

MALE AND FEMALE. Male as shown in Pl. 4, fig. 1. The anterior margin of the preocular nodus is of the *ochraceus* type (Text-fig. 38); preocular enlargement with three or four setae each side (Text-fig. 4); dorsal head setae *a* spiniform in the male. The prosternal plate does not surround the prosternal setae and there are no long anterior setae on the metanotum. Form of the marginal setae on the prothorax, marginal tergal setal pattern of metathorax and abdomen, the relative lengths of the post-spiracular setae, internal processes of the tergites and the sclerite of the genital sac as in *ochraceus*. There are anterior setae on at least some of the abdominal tergites, and in all the females examined and most of the males some of the tergites (a greater number of these in the female than in the male) have a definite row of anterior setae. Length and thickness of tergal setae as in *hoplopteri*. There are no anterior setae on the tergite of the last segment. Genital region of female as in Text-fig. 71.

MATERIAL EXAMINED. 27 ♂, 32 ♀ from *Stephanibyx coronatus* (10 individuals) from Kenya, S.W. Africa and S. Africa.

Holotype male and *allotype* female, slide No. 20445 in the British Museum (Natural History) from *Stephanibyx c. coronatus* (Boddaert) from Isiolo, Kenya, January, 1956. *Paratypes*: 26 ♂, 31 ♀ with data as given above.

Measurements in mm.

	Male		Female	
	Length	Breadth	Length	Breadth
Head .	0.37	0.51	0.35	0.52
Prothorax .	—	0.33	—	0.34
Metathorax .	—	0.46	—	0.48
Abdomen .	1.15	0.55	1.35	0.67
Total .	1.85	—	2.05	—

Male breadth of head, b.1: range 0.48–0.51, mean 0.49; b.2: range 0.35–0.37, mean, 0.36 (10 specimens).

The *tetralicis* Species-group

This group is represented by a single species, *A. tetralicis* sp. n., the affinities of which are doubtful. The characters in which it resembles the *ochraceus-hoplopteri* group, that is, the spiniform setae of the male, marginal setae of the prothorax, metathorax and abdominal tergites may be primitive characters and of no phylogenetic importance. However, the sclerite of the genital sac appears similar to that of *hoplopteri* and may indicate relationship.

Actornithophilus tetralicis sp. n.

Type host: *Burhinus oedicnemus* (Linn.)

(Pl. 4, fig. 2, Pl. 9, fig. 5, Pl. 10, fig. 6; Text-figs. 22, 40, 48, 53, 54, 58)

This species is distinguished from the *ochraceus-hoplopteri* group by the relatively smaller preocular nodi (see above, p. 200), the more numerous setae on the legs and



3

FIG. 3. *Actornithophilus totani* (Schrank). Male from type host.

in the sternal brush, the relative lengths of the post-spiracular setae and the sclerite of the genital sac.

MALE AND FEMALE. Male as shown in Pl. 4, fig. 2. Preocular nodi as in Text-fig. 40; dorsal head setae a. spiniform in the male; prosternal plate surrounds prosternal setae. Marginal setal pattern of pronotum, metanotum and abdominal tergites as in *ochraceus*, relative lengths of tergal setae as shown in Text-fig. 48; post-spiracular setae III and V not markedly shorter than II and IV. Brushes on third femora and sternite IV thicker than in *ochraceus* and *hoplopteri* (Pl. 9, fig. 5). The chaetotaxy of the legs differs from most of the species from the Charadrii examined in having one or two extra outer latero-ventral setae on tibiae II-III and usually having more numerous latero-dorsal setae on tibiae I-III, III has 7-9 in the male and 7-10 in the female (see above, p. 195, Text-figs. 53-54). Sclerite in genital sac as in Pl. 10, fig. 6. Last segment of female abdomen as in Text-fig. 58. Measurements as given below. Specimens from Suffolk birds measure rather less than those from Israel, but this may partly be due to the condition of the Suffolk specimens.

MATERIAL EXAMINED. 6 ♂, 10 ♀ from *Burhinus oedicnemus* (Linn.) from Israel; 3 ♂, 11 ♀ from *B. o. oedicnemus* from Suffolk, England; 1 ♂ from *Burhinus s. senegalensis* (Swainson) from North Cameroon. 2 ♂, 3 ♀ in rather poor condition from *Esacus recurvirostris* (Cuvier) from Upper Burma may belong to this species.

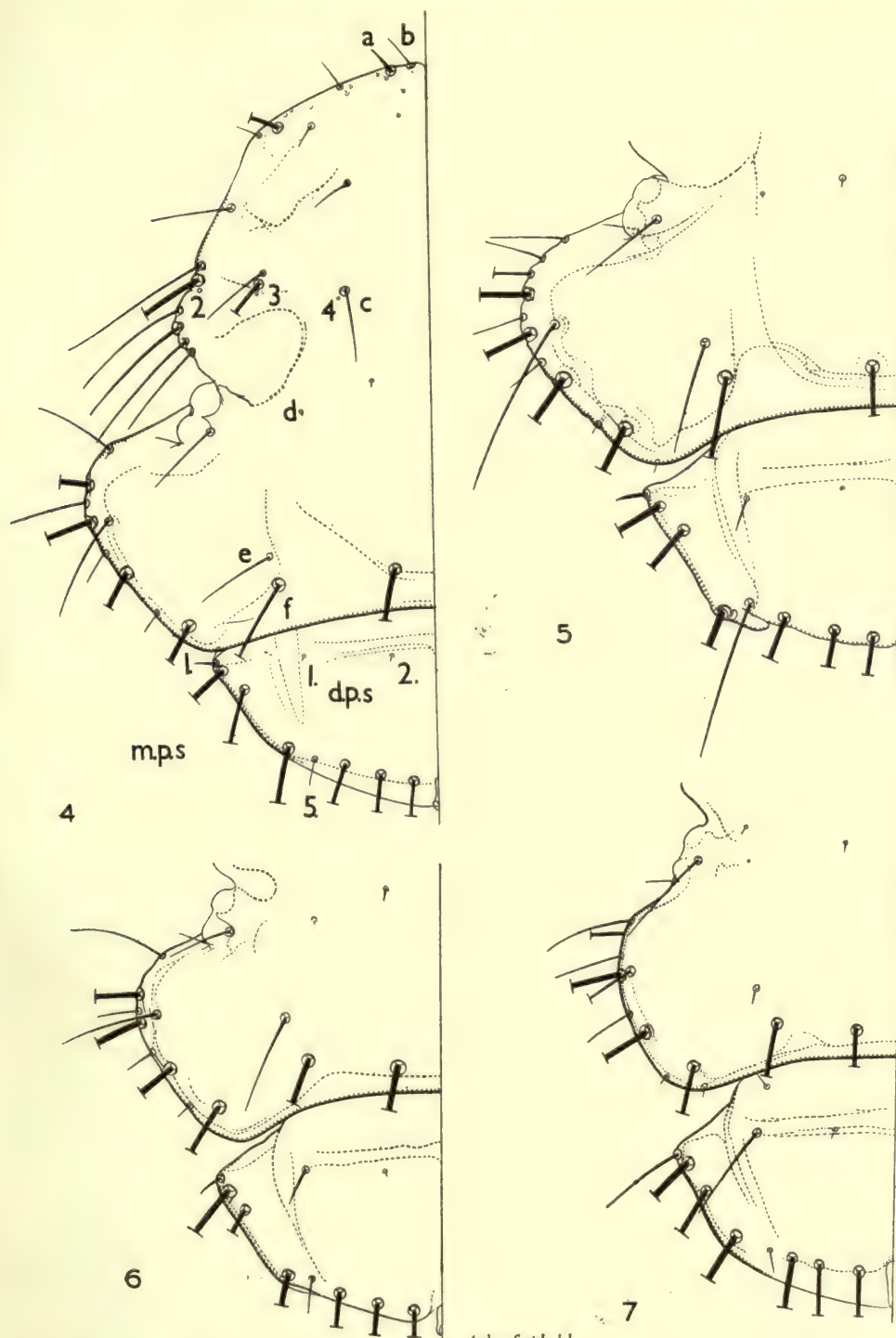
Holotype ♂ and *allotype* ♀ in the British Museum (Natural History) from *Burhinus oedicnemus* from Oranim, Israel collected by M. Costa, 20.v.1956. *Paratypes*: 2 ♂, 4 ♀ from the same host individual as the holotype and 3 ♂, 11 ♀ from the same host species from England, data as given above.

Measurements in mm.

	Male		Female	
	Length	Breadth	Length	Breadth
Head . . .	0.400	0.585	0.430	0.630
Prothorax . .	—	0.380	—	0.410
Metathorax . .	—	0.525	—	0.585
Abdomen . . .	1.380	0.710	1.630	1.030
Total . . .	2.185	—	2.530	—

The *uniseriatus* Group

The species comprising this group resemble those of the *ochraceus* group and should perhaps be included in it; they differ mainly in the characters of the chaetotaxy. Marginal prothoracic seta 5 and marginal metathoracic seta 2 (Text-figs. 5, 46) are usually longer and less fine than in *ochraceus* although in *mexicanus* the difference is less marked; the inner tergo-central setae of the abdomen are markedly shorter than the outer one each side (Text-fig. 49) and there is a tendency to have a greater number of tergo-central setae. Both sexes of *A. uniseriatus* and *A. mexicanus* usually have two or more segments with eight or more tergo-central setae, although occasional males are found in which the majority of tergites have six setae with one



Arthur Smith del.

FIGS. 4-7. Male head and prothorax (dorsal) of *Actornithophilus* spp. 4. *A. crinitus* sp. n. 5. *A. uniseriatus*. 6. *A. umbrinus*. 7. *A. sabulosus* sp. n. a-f.—dorsal head setae; 2-4.—dorsal head sensilli; m.p.s.—marginal prothoracic setae; d.p.s.—dorsal prothoracic setae.

or two having seven. In *A. himantopi* only an occasional female has one or two segments with eight tergo-central setae, the majority of males and females having tergal pattern A. Anterior setae on the tergites usually absent, only one specimen (a female of *A. uniseriatus*) has been seen with anterior tergal setae, and on two segments these form a definite anterior row. The sclerite in the genital sac is elongate and, allowing for individual variation, rather less deeply divided anteriorly than in *ochraceus*. *A. mexicanus* differs from the other two species in the male by having dorsal head setae a spiniform. The preocular nodi are similar to those of the *ochraceus* group and as in that group become shorter (from side to side) and broader (anterio-posteriorly) as the head decreases in breadth (Text-figs. 30-32).

It has not been possible to find any characters which can be used to separate the populations from *Recurvirostra avosetta* and *R. americana*, although in the small number of specimens available, the head breadth of the male in the population on *R. avosetta* averages larger than in those on *A. americana*:

R. avosetta population: range, 0.540-0.555; mean, 0.547 mm. (5);

R. americana population: range, 0.505-0.540; mean, 0.520 mm. (7).

A. uniformis (Kellogg) **syn. n.** is here considered as a synonym of *uniseriatus*.

Included species: *A. uniseriatus* (Piaget, 1880); *A. himantopi* (Blagoveshtchensky, 1951) and *A. mexicanus* Emerson, 1953.

The type series of *A. uniseriatus* in the Piaget collection of the British Museum (Natural History) comprises 1 ♂, 4 ♀, of which the male and one female on slide 1380 are *A. totani* and the remaining female on slide 1380 and the two females on slides 1382 and 1381 are the species usually found on *Recurvirostra avosetta*. In Clay (1953: 657) the male was wrongly designated as lectotype; this mistake is here rectified.

Lectotype of *Colpocephalum uniseratum* Piaget, 1880: ♀ in the Piaget collection, British Museum (Natural History), slide No. 1380.

The *umbrinus* group

The *umbrinus* group is used here to include a number of species in which the preocular, occipital and thoracic nodi are small, the anterior head setae are not sexually dimorphic, the males usually do not have tergal setal pattern A, some tergites in both sexes have anterior setae, often numerous in the male, tergite VIII of the female normally has six or more central setae and the pleurites are not deeply bilobed as in the *ochraceus-hoplopteri* group. The species are found generally throughout the family Scolopacidae (*sens.* Peters, 1934), but *patellatus* from *Numenius arquatus* (see above, p. 192) and *bicolor* from *Arenaria*, of the subfamily Arenariinae, are not typical of the *umbrinus* group. The small amount of material said to have been taken from *Steganopus* (family Phalaropidae) can be included here but the host records need confirmation.

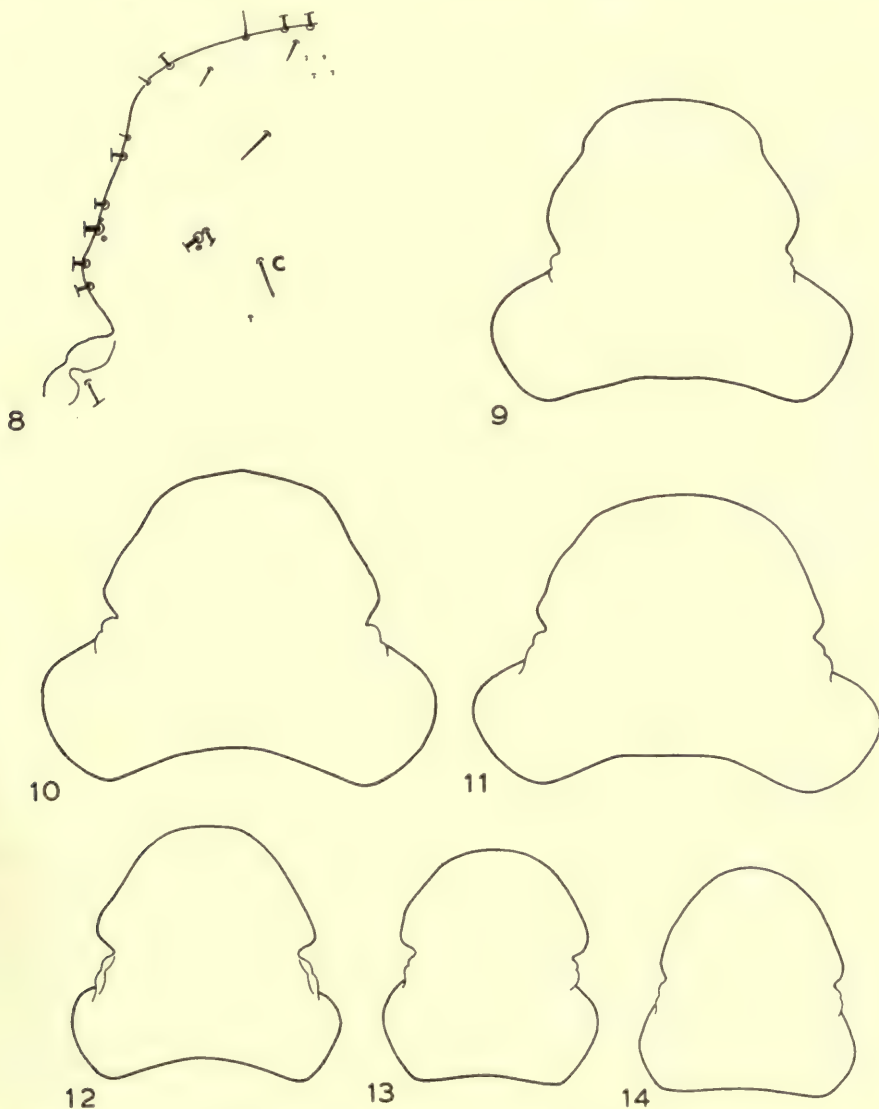
Included species (some of which are discussed in detail below):

A. umbrinus, *A. pustulosus*, *A. totani*, *A. lyallpurensis*, *A. flumineus*, *A. paludosus*, *A. lacustris*, *A. limarius*, *A. spinulosus*, *A. limosae*, *A. kilauensis*, *A. multisetosus* and probably *A. stictus*.

There are three subdivisions of the *umbrinus* group.

Subdivision I

Specimens have been seen from species belonging to most of the genera of the subfamily Erolinae. These have the following characters: the prosternal plate does not surround the prosternal setae and is usually pointed posteriorly, but there is individual variation in this last character; there is also a tendency for individuals to have one long seta in the centre of the prosternal plate; the first dorsal pro-



FIGS. 8-14. Heads of *Actornithophilus* spp. 8. *A. incisus*, ♀. 9. *A. patellatus*, ♂. 10. *A. limosae*, ♀. 11. *A. ardeolae*, ♀. 12. *A. sabulosus* sp. n., ♂. 13. *A. erinaceus*, ♂. 14. *A. pediculoides*, ♂.

thoracic seta is relatively long and stout (Text-fig. 6), and the metanotum has long anterior setae. In the male, the tergites have a row of stout elongate submarginal setae and rows of smaller setae (Pl. 4, fig. 3), and the last tergite has anterior dorsal setae. The ventral thickening of the last segment of the female is in the form of two broad sclerites (Text-fig. 6g). Sclerite of the genital sac as shown in Pl. VII, fig. 1.

The populations of the *umbrinus* group found on the Eroliainae show a general correlation between average size of the individuals and the size of the host; correlated with increase in the size of the louse there is a tendency towards increase in the number of setae on some of the abdominal segments, but although the average number of setae is greater in the populations from the larger hosts, there is usually some overlap in numbers between the different populations. As the head becomes broader it tends to become proportionally shorter (Table I, Pl. 6, figs. 4-6) so that specimens from *Erolia subminuta* appear rather different from those from *Calidris canuta*; however, the populations from *Erolia minuta* and *E. testacea* show intermediates between those from the former two hosts so that subspecific division is unsatisfactory. *Ac.ornithophilus umbrinus* therefore will be used for the populations from *Erolia*, *Canuta*, *Crocethia*, *Ereunetes*, *Micropalama* and *Tryngites*. The synonymy of names included under *umbrinus sens. lat.* is given below.

The population from *Philomachus*, although resembling these populations, is distinguished by the less well developed lingual sclerites and epipharyngeal crest; by the female usually having no anterior setae on the last tergite (one individual amongst 26 examined had anterior setae); in the form of the sclerite of the genital sac (Pl. 10, fig. 2) and the shape of the last segment of the female abdomen. It is here recognized as a good species, *A. pustulosus*.

Actornithophilus umbrinus (Burmeister, 1838)

(Pl. 6, figs. 4-6, Pl. 7, fig. 3, Plate 10, fig. 1; Text-figs. 6, 19, 57, 69)

Colpocephalum umbrinum Burmeister, 1838. *Handb. Ent.* 2: 438. Host: *Tringa subarquata* = *Erolia testacea* (Pallas).

Colpocephalum umbrinum Burmeister. Giebel, 1874. *Insecta Epizoa*: 274, pl. 14, fig. 4.

Colpocephalum umbrinum Piaget, 1880. *Pediculines*: 556, pl. 46, fig. 6, nec *C. umbrinum* Burm. Host: *Tringa subarquata*.

Colpocephalum umbrosum, Harrison, 1916. *Parasitology*, 9: 56. *Nomen novum* for *C. umbrinum* Piaget nec Burmeister. **Syn. nov.**

Colpocephalum trilobatum Giebel, 1874. *Insecta Epizoa*: 275. Host: *Tringa minuta* = *Erolia minuta* (Leisler).

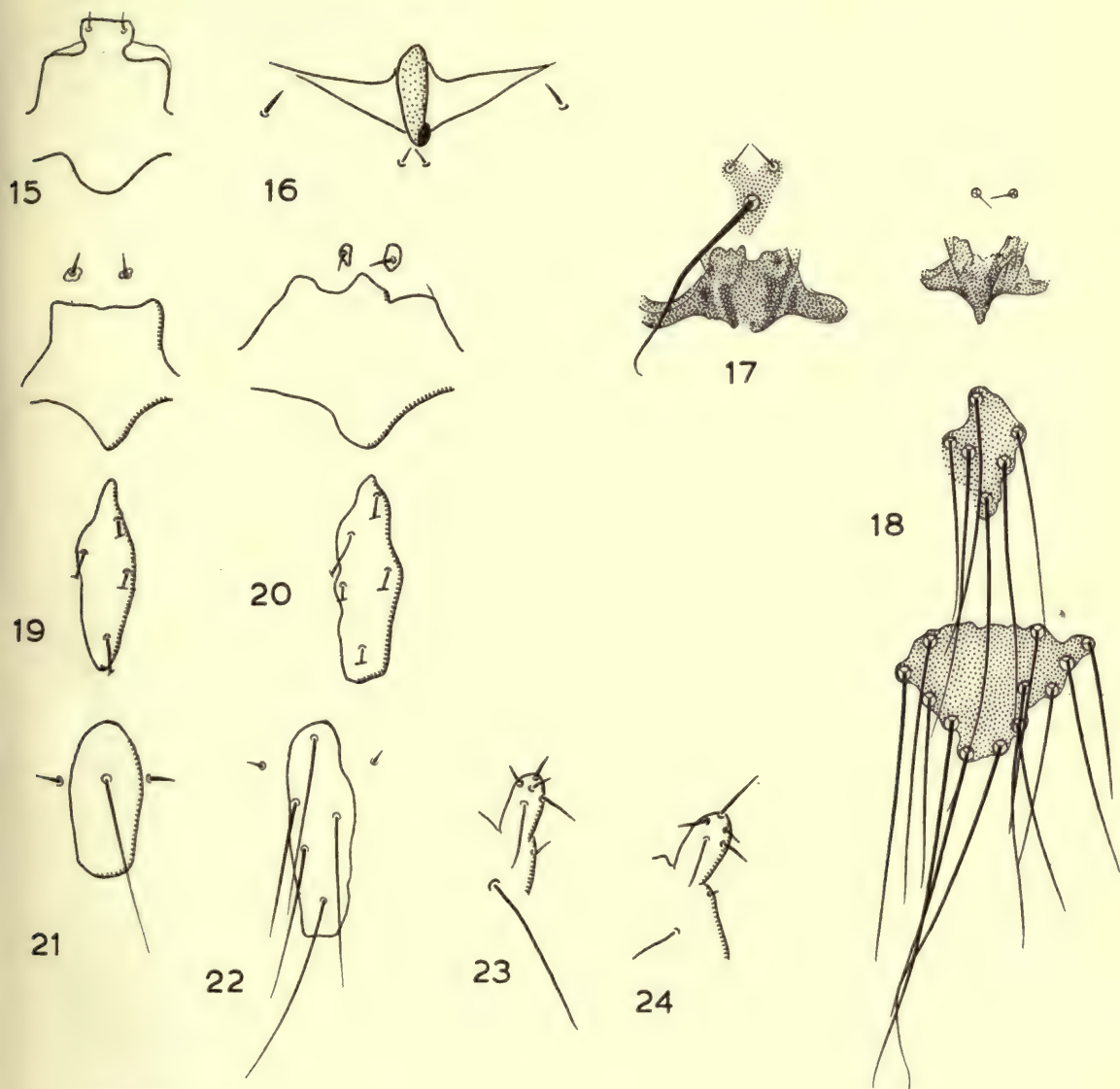
Colpocephalum morsitans Kellog & Mann, 1912. *Ent. News*, 23: 15, fig. 3. Host: *Tringa maculata* = *Erolia melanotos* (Vieillot).

Colpocephalum minor Kellogg & Chapman, 1899. *Occ. Pap. Calif. Acad. Sci.* 6: 112, pl. 7, fig. 9, nec *C. minor* Piaget, 1880. Host: *Calidris arenaria* = *Crocethia alba* (Pallas).

Actornithophilus albus Emerson, 1948. *Ent. News*, 59: 178, figs. 1, 2. Host: *Crocethia alba* (Pallas).

Actornithophilus hrabei Balát, 1953. *Folia zool. ent. Brno*. 2 (16): 8, fig. Host: *Calidris alpina* = *Erolia alpina* (Linn.).

Actornithophilus hirsutus Carriker, 1954. *Florida Ent.* 37: 139, fig. Host: *Ereunetes pusillus* (Linn.). **Syn. n.**



FIGS. 15-24. Fig. 15. *A. lyallpurensis*, male prosternal plate and setae. Fig. 16. *A. grandiceps*, anterior mesothoracic setae. Fig. 17. *A. pediculoides*, male prosternal plate and setae. Fig. 18. *A. sabulosus*, sp. n., male sternal plates of thorax. Figs. 19-20. Prosternal and mesosternal plates. 19. *A. umbrinus*. 20. *A. lacustris* sp. n. Figs. 21-22. Mesosternal plates. 21. *A. picus* from *Thalasseus bergii*. 22. *A. tetralicis* sp. n. Figs. 23-24. Labial palp. 23. *A. totani*. 24. *A. incisus* (Figs. 17-18. *A. Smith del.*).

Burmeister (1838) gave a short description of the specimen in the Nitzsch collection which was later figured in Giebel (1874). This figure appears to represent the *Actornithophilus* found on the type host. Piaget (1880) described and figured specimens from *Tringa subarquata* which he called *umbrinum*, but which he considered to be different from the figure in Giebel (1874); he suggested (557, 559) that the Nitzsch specimen had probably originated from *Philomachus pugnax*. However, the figure of a female in Giebel (1874) shows distinctly a number of setae on the dorsal surface of the last abdominal segment, which are not found in the population from *Philomachus pugnax* (one specimen from this host with one seta has been seen). There is one male in the Piaget collection labelled *Colpocephalum umbrinus* which is the species found on *Erolia testacea*. As already discussed above there seems no advantage in attempting to name the populations from the various species of *Erolia* and related genera and so the names which have been used are given above in the synonymy.

Neotype of *Colpocephalum umbrinum* Burmeister, 1838: ♂ in the British Museum (Natural History), slide No. 658 from *Erolia testacea* (Pallas) from North Cameroon collected by Dr. J. Mouchet, 1959.

Lectotype of *Colpocephalum umbrinum* Piaget: ♂ in the Piaget collection, British Museum (Natural History), slide No. 1379.

Measurements in mm.

A. umbrinus from *Erolia testacea*

	Male		Female	
	Length	Breadth	Length	Breadth
Head . .	0.325	0.440	0.340	0.460
B.2 . .	—	0.345	—	0.340
Prothorax . .	—	0.330	—	0.340
Metathorax . .	—	0.420	—	0.480
Abdomen . .	1.040	0.505	1.290	0.630
Total . .	1.720	—	2.010	—

Subdivision II

This subdivision comprises the populations from *Tringa* (including *Actitis*), and new species from *Catoptrophorus* and *Limnodromus*. *A. kilauensis* from *Heteroscelus* is probably also near this group but the only material seen from the type host is the lectotype female which is in poor condition. The classification of the populations from the different species of *Tringa* is difficult mainly due to the greater amount of individual variation in size and chaetotaxy than is usual in *Actornithophilus*. In most cases the number of specimens is small and it will be necessary to obtain larger series to make sure that the apparent differences in size between populations from the same host species from different localities (Tables III, VI) are not due to methods of collecting and preparation. Four groups (within the *totani* group) in addition to *A. paludosus*, well defined in the males at least, have here been recognized as species and are listed below with their hosts; the females cannot always be separated.

Host	<i>Actornithophilus</i> species from <i>Tringa</i> and <i>Actitis</i>	
<i>Tringa totanus</i> .	} <i>A. totani</i> (Schrank, 1803)	} <i>totani</i> group
<i>Tringa erythropus</i>		
<i>Tringa flavipes</i> .		
<i>Tringa stagnatilis</i>		
<i>Tringa glareola</i> .	<i>A. totani</i> (Schrank, 1803) <i>sens. lat.</i>	
<i>Tringa ochropus</i> .	<i>A. lyallpurensis</i> Ansari, 1955	
<i>Actitis hypoleucos</i> .	<i>A. flumineus</i> sp. n.	
<i>Tringa nebularis</i> .	} <i>A. paludosus</i> sp. n.	
<i>Tringa melanoleuca</i>		

***Actornithophilus totani* (Schrank, 1803)**Type host : *Tringa totanus* (Linn.)

(Pl. II, fig. 1 ; Text-figs. 3, 23, 41, 59, 60)

Pediculus totani Schrank, 1803. *Fauna Boica* : 191. Host : " Strandschnepfen " = *Tringa totanus* (Linn.).*Colpocephalum affine* Nitzsch, 1874. In Giebel, *Insecta Epizoa* : 276. Host : *Totanus maculatus* = *Tringa erythropus* (Pallas). **Syn. n.**

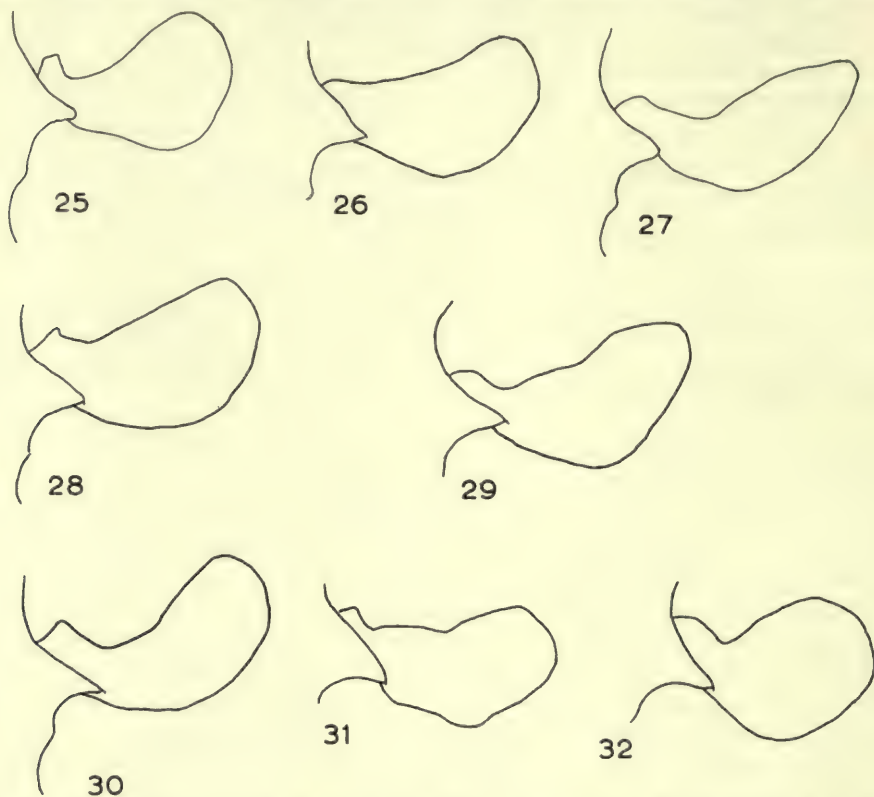
The history and interpretation of this name, the earliest to be used for an *Actornithophilus*, has been dealt with in Clay & Hopkins (1960 : 18).

MALE AND FEMALE. The species is distinguished from other forms belonging to this group by having no long anterior seta on the metanotum, by having anterior dorsal setae on the last segment of the abdomen in the male, by the size and arrangement of the male tergal setae (Text-fig. 3) and by the prosternal plate surrounding the prosternal setae. Genitalia as in Pl. 8, fig. 1 and Text-figs. 59-60. In the female at least two or more tergites have seven or more central setae and tergites II-VIII have a row of anterior setae. Genital region of female abdomen of the type shown in Text-fig. 71. Measurements in Tables III, IV and V.

The variation in the number of tergal setae of the male abdomen (Table II) means that individuals may appear considerably different from each other. Although the populations of which the average size of the individuals is smaller tend to have fewer setae this is not invariable, for instance one male from the same host individual as the neotype (Text-fig. 3) has the number of setae greatly reduced. In Table III the measurements of the breadth of the head at the temples of males is given for specimens from *Tringa totanus* from various localities. The numbers for some are small and in the females the differences are less and perhaps not significant. Fresher and more extensive material is required for a statistical analysis of these size relationships.

The populations from *Tringa totanus*, *T. erythropus*, *T. flavipes* and *T. stagnatilis* do not appear to be distinguishable from each other (Table IV). Specimens from *T. glareola* are difficult to place : the males have fewer tergal setae than is usual in *totani* but overlap with an occasional specimen from *Tringa totanus* which shows reduced tergal chaetotaxy ; one male said to have been taken from *T. glareola* in S. Africa has the tergal setae as in the new species from *A. hypoleuca* but differs in

the proportions of the head, suggesting that it may be an abnormal specimen of the population usually found on *Tringa glareola*. In the specimens available from *T. glareola* it is always possible to distinguish the females from *totani sens. str.* as all segments show marginal tergal pattern A, but further material may include an occasional specimen (as in *lyallpurensis*) with a greater number of tergoventral



FIGS. 25-32. Preocular nodi of *Actornithophilus* spp., males. Scale adjusted so that breadth at preocular enlargement is the same; actual breadth at temples in mm. of specimen given in brackets. Figs. 25-28. *A. ochraceus sens. lat.* 25. Host: *Charadrius tricollaris* (0.41). 26. Host: *Pluvialis apricaria* (0.48). 27. Host: *Chettusia gregaria* (0.51). 28. Host: *Squatarola squatarola* (0.49). Fig. 29. *A. gracilis* (0.51). Fig. 30. *A. uniseriatus* (0.55). Fig. 31. *A. himantopi* (0.49). Fig. 32. *A. mexicanus* (0.47).

setae. On the available material from *T. glareola* it would not be satisfactory to name the population, but as it shows some differences which indicate that it is perhaps rather distinct it is included in *totani* as *totani sens. lat.*

MATERIAL EXAMINED. 39 ♂, 43 ♀ from *Tringa totanus* (Linn.) from Iceland, British Isles, Estonia, Czechoslovakia, Morocco, Israel, Sudan, Ceylon; 4 ♂, 4 ♀ from *T. erythropus* (Pallas) from Yugoslavia, Czechoslovakia, India; 6 ♂, 5 ♀ from *Tringa stagnatilis* (Bechstein) from Sudan, East Africa and India; 10 ♂, 16 ♀ from *T. flavipes* (Gmelin) from various localities in N. America.

Neotype male (Text-fig. 3) and *neallotype* female of *Actornithophilus totani* (Schrank, 1803) in the Meinertzhagen collection, British Museum (Natural History) slide No. 11977a from *Tringa t. totanus* from Morocco, October, 1938.

***Actornithophilus flumineus* sp. n.**

Type host : *Actitis hypoleucos* (Linn.)

(Pl. 4, fig. 5)

This species is distinguished from *totani* by the shape of the head and by the smaller number of tergal setae, in which character it resembles *lyallpurensis*. It is distinguished from this latter species by the shape of the head and the presence of anterior dorsal setae on the last segment of the male.

MALE. As shown in Pl. 4, fig. 5. General characters of head, thorax, sternal chaetotaxy of the abdomen and male genital sclerite as in *totani*. Post-spiracular setae I, III and V shorter than II and IV but III not markedly shorter as in *totani*. Abdominal tergites I–VII with setal pattern A, VIII with 4, 5 or 6 central setae; tergites II–VIII usually with one row of anterior setae, but in some specimens some of the posterior tergites (V–VIII) may have two irregular rows; last abdominal segment with anterior dorsal setae.

FEMALE. Head and thorax as in male. Abdominal tergites I–VII with setal pattern A; VIII also usually with pattern A, one specimen has only three central setae. Tergites I–VIII may have a row of anterior setae, or I, VII and VIII may have only one or two anterior setae or VIII may have no anterior setae. Measurements of both sexes in Table V.

MATERIAL EXAMINED. 8 ♂, 12 ♀ from *Actitis hypoleucos* from various localities in Europe and Africa.

Holotype ♂ and *allotype* ♀ in the British Museum (Natural History), slide No. 7627 from the type host from Kenya, April, 1956. *Paratypes*: 7 ♂, 11 ♀ from the same host form with data as given above.

***Actornithophilus lyallpurensis* Ansari, ? 1955**

Type host : *Tringa ochropus* Linn.

(Text-fig. 15)

Actornithophilus lyallpurensis Ansari, ? 1955. *Proc. VIIth Pakistan Sci. Conf. (Agriculture)* : 55.

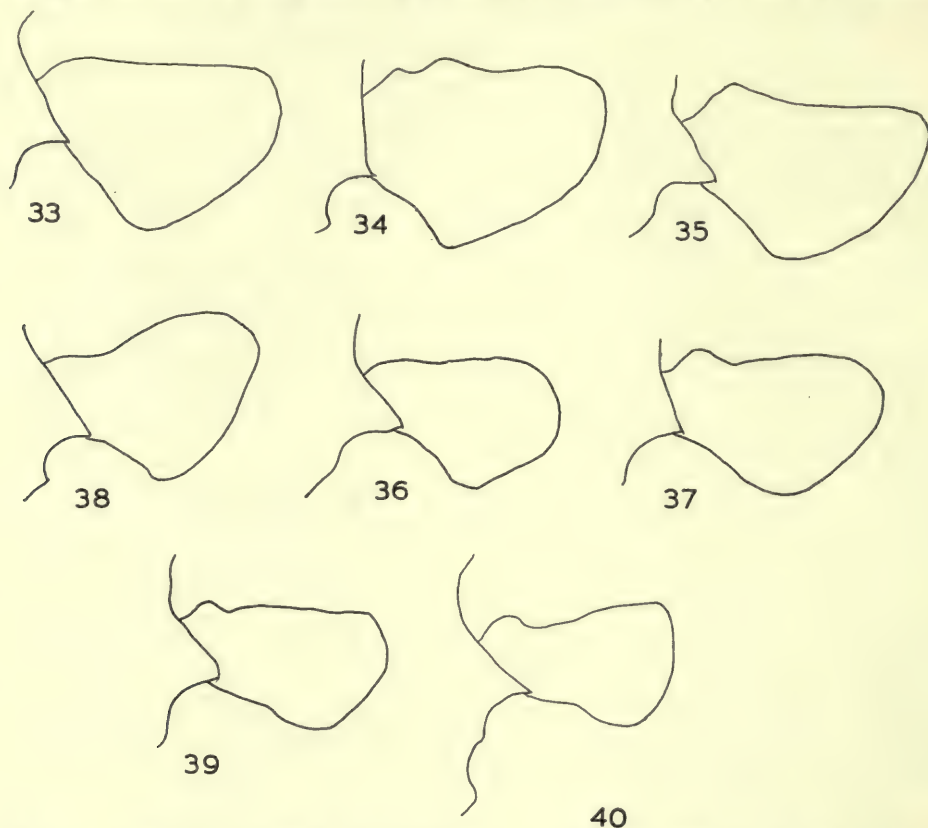
Type host : *Tringa ochropus* Linn.

Actornithophilus lyallpurensis Ansari, 1956. *Indian J. Ent.* **17** (1955) : 400.

Actornithophilus lyallpurensis Ansari, 1957. *Indian J. Ent.* **18** (1956) : 434, figs.

The species was described three times as a new species and it has not been possible to ascertain which is the earliest description as the date of publication of the first mentioned description is not known for certain. The measurements of the breadth of the head given in the original descriptions are different from those of specimens found on *Tringa ochropus* and given below (Table VII); however, it seems probable

that Ansari's description does refer to the population normally found on this host. This species is distinguished from *A. totani* by the abdominal chaetotaxy, and from *A. flumineus* sp. n. by the shape of the head and the absence of anterior dorsal setae on the last abdominal segment of the male. The small number of males seen show tergal pattern A on segments I, II and VII; on III, IV, V and VI the central



FIGS. 33-40. Preocular nodi of *Actornithophilus* spp., males. Scale as in Figs. 25-32. Figs. 33-37. *A. hoplopteri* sens. lat. 33. Host: *Hoplopterus spinosus* (0.49). 34. Host: *Lobibyx novaehollandiae* (0.51). 35. Host: *Chettusia leucura* (0.47). 36. Host: *Pluvianus aegyptius* (0.46). 37. Host: *Charadrius vociferus* (0.45). Fig. 38. *A. crinitus* sp. n. (0.51). Fig. 39. *A. pauliani* (0.51). Fig. 40. *A. tetracis* sp. n. (0.58).

setae vary from six to eight; segment VIII usually has setal pattern A but may have only five central setae. Of the females seen all have setal pattern A on segments I-VII with the exception of two specimens with one and two segments respectively with seven central setae and one specimen which has the number of central tergal setae as follows: I, 6; II, 7; III, 10; IV, 7; V, 8; VI, 7; VII, 6. Tergite VIII has setal pattern A in all specimens seen with the exception of one specimen which has only four central setae. All the tergites may have a row of anterior setae, but on I and VIII the anterior setae may be reduced in number or absent.

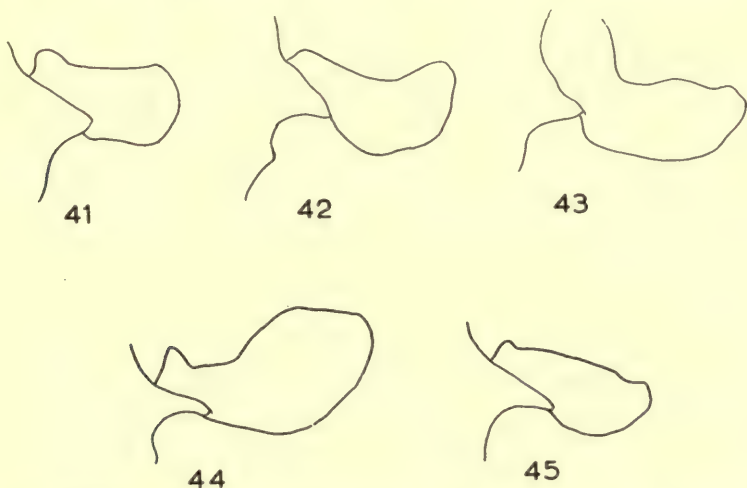
MATERIAL EXAMINED. 5 ♂, 10 ♀ from *Tringa ochropus* from Poland, Czechoslovakia and Israel.

***Actornithophilus paludosus* sp. n.**

Type host : *Tringa nebularia* (Gunnerus)

(Pl. 5, figs. 3, 6 ; Text-fig. 47)

This species is distinguished from the other species found on *Tringa* and *Actitis* by the presence of long dorsal setae on the metathorax, by the prosternal plate not enclosing the prosternal setae and by the form of the sclerite of the genital sac.



FIGS. 41-45. Preocular nodi of *Actornithophilus* spp. Figs. 41-43 with scale as in Figs. 32-40 ; Figs. 44-45 to same scale. Fig. 41. *A. totani*, ♂. Fig. 42. *A. limosae*, ♀. Fig. 43. *A. ardeolae*, ♀. Fig. 44. *A. grandiceps*, ♀. Fig. 45. *A. spinulosus*, ♀.

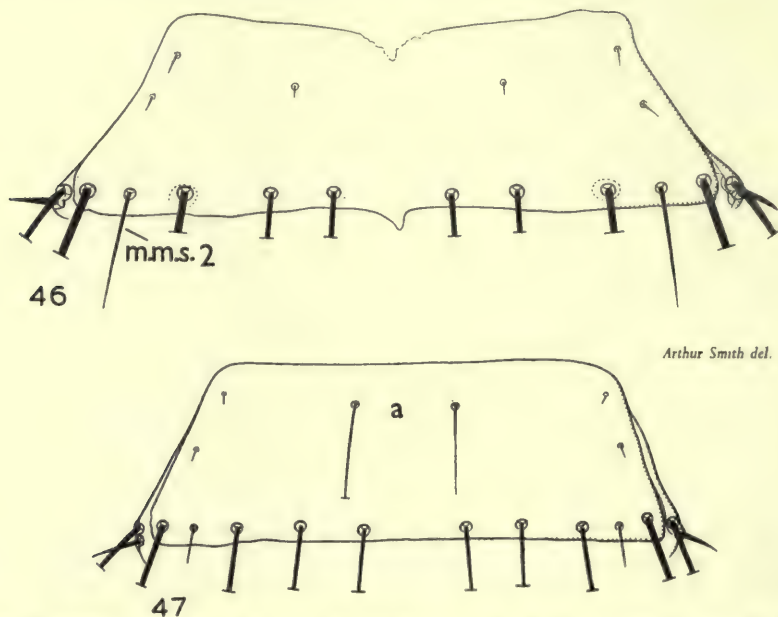
In many characters it resembles more closely the new species *A. lacustris* and *limarius* from *Catoptrophorus* and *Limnodromus*, although the general appearance of the tergal chaetotaxy is similar to that of *totani*.

MALE. As shown in Pl. 5, fig. 3. The prosternal plate does not surround the prosternal setae ; metathorax with two to four, occasionally one, long dorsal setae. Other characters of the head, thorax and abdomen as in *totani* with a similar range of variation of chaetotaxy. The small amount of material seen from *T. nebularia* falls into two size groups (see below), one from hosts collected in Aden and the Sudan and the other in Czechoslovakia ; those in the smaller size group tend to have fewer tergal setae, but there is some overlap in this character between the two groups. Last segment with anterior dorsal setae. The sclerite of the genital sac is longer and less triangular than in *totani* and more similar to that of *limosae*.

FEMALE. Head and thorax as in male, but two females from *T. melanoleuca* have no long dorsal setae on the metathorax. All tergites may have setal pattern

A, but the following range of tergocentral setae has been found: I, 6; II, 6-7; III, 6-11; IV, 6-10; V, 6-13; VI, 6-12; VII-VIII, 6. Two specimens from the same host have the following number of central setae: I, 6. 6; II, 6. 6; III, 6. 7; IV, 6. 10; V, 6. 13; VI, 6. 12; VII-VIII, 6. 6. The central tergites usually have two well-defined rows of setae but I, II, VII and VIII may have no anterior setae, one or two anterior setae or a well-defined row. Measurements of both sexes in Tables V, VI.

MATERIAL EXAMINED. 12 ♂, 19 ♀ from *Tringa nebularia* (Gunnerus) from Port Sudan, Aden, Burma and Czechoslovakia; 9 ♂ 13 ♀ from *Tringa melanoleuca* (Gmelin) from various localities in North America.



FIGS. 46-47. Metanotum of *Actornithophilus* spp. 46. *A. uniseriatus*. 47. *A. paludosus* sp. n. m.m.s. 2—marginal metathoracic seta 2; a.—long anterior setae of metanotum.

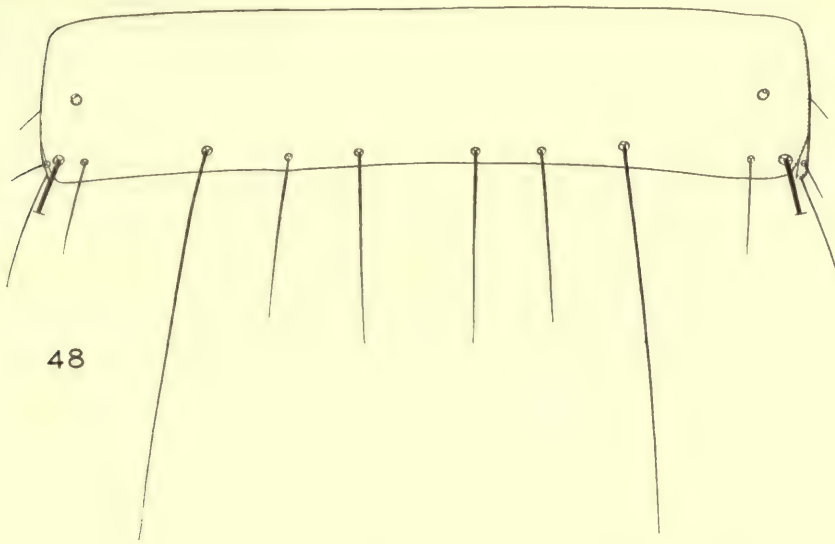
Holotype ♂ and *allotype* ♀ slide No. 16845 in the Meinertzhagen collection, British Museum (Natural History) from *Tringa nebularia* from Port Sudan, Sudan, December, 1947. *Paratypes*: 11 ♂, 18 ♀ from the same host form from localities given above.

Actornithophilus lacustris sp. n.

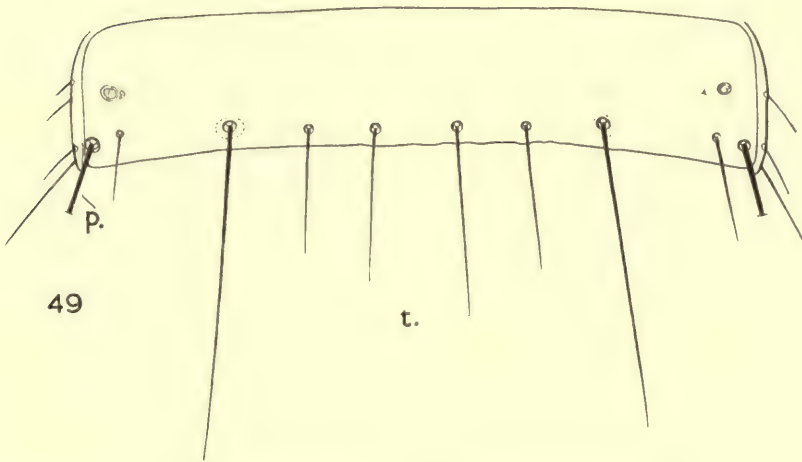
Type host: *Catoptrophorus semipalmatus inornatus* (Brewster)

(Pl. 5, figs. 1, 4, Pl. 11, fig. 5; Text fig. 20)

This species resembles most closely *A. limarius* and *A. paludosus* from which it can be separated by the size and number of tergal setae, size and shape of the head and by the prosternal plate usually having an anterior median projection.

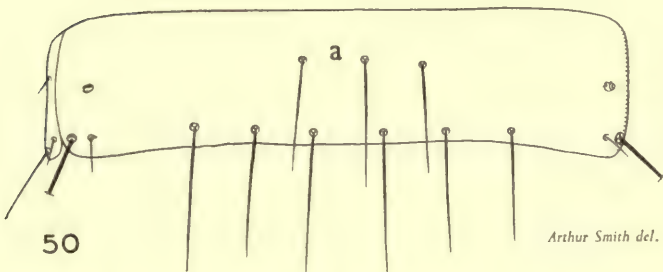


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49

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FIGS. 48-50. Abdominal tergite V, male. 48. *A. tetralicis* sp. n. 49. *A. uniseriatus*. 50. *A. crinitus* sp. n. p.—post-spiracular seta; t.—6 tergocentral setae; a.—anterior tergal setae.

MALE. As shown in Pl. 5, fig. 1. Chaetotaxy of head and thorax as in *A. totani* except that dorsal head setae *d* are somewhat longer, the metanotum has long anterior setae, marginal prothoracic setae 5 and marginal metathoracic setae 2 tend to be longer and less fine and there are usually a greater number of setae on the meso- and metasternal plates. The prosternal plate does not surround the prosternal setae and usually has an anterior median projection (Text-fig. 20). Abdominal chaetotaxy similar to that of *totani* but differs in the density and size of the setae (Pl. 2, fig. 4); last segment with anterior dorsal setae. Genital sclerite as in Pl. 8, fig. 5.

FEMALE. Head and thorax as in male. Tergites I–VIII may have setal pattern A, but most specimens have two or more tergites with seven or more central setae; the allotype, for instance, has setal pattern A, while the tergo-central setae of another specimen are as follows: I, 6; II, 6; III, 7; IV, 7; V, 9; VI, 7; VII–VIII, 6; tergites I–VIII have anterior setae forming a definite row on most segments; last segment without anterior setae. Measurements of both sexes in Table VII.

The females of *A. lacustris* are not always easily distinguishable from those of *A. paludosus* unless both are available for comparison, especially when considering the relative length and thickness of the setae; these are stouter and longer in *A. lacustris*. In the latter host the females tend to be larger and most specimens have two or more tergites with seven or more central setae and the prosternal plate usually has an anterior median projection. In *A. paludosus* these characters may also occur and the measurements may overlap, but probably not all in the same specimen.

MATERIAL EXAMINED. 18 ♂, 19 ♀ from *Catoptrophorus semipalmatus inornatus* (Brewster) and *C. s. semipalmatus* (Gmelin) from California, Utah and Texas.

Holotype ♂ and *allotype* ♀ slide No. 12744a in the Meinertzhagen collection, British Museum (Natural History) from *Catoptrophorus semipalmatus inornatus* California, March, 1939. *Paratypes*: 17 ♂, 18 ♀ from the two forms of *C. semipalmatus*.

Actornithophilus limarius sp. n.

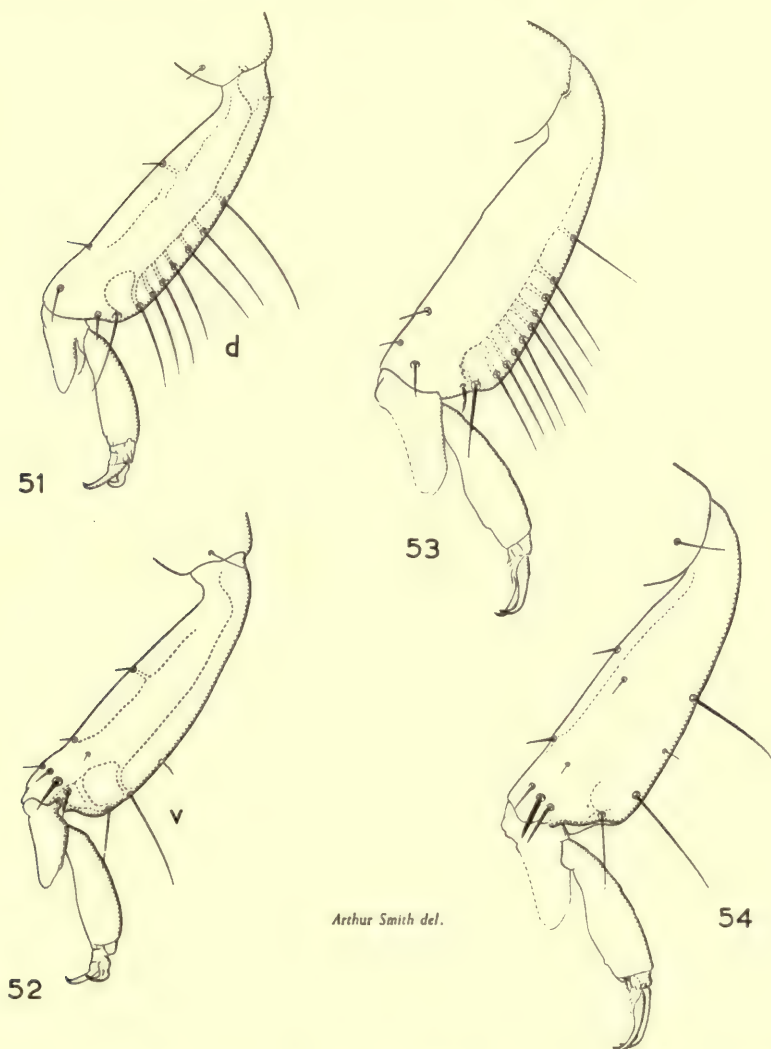
Type host: *Limnodromus griseus scolopaceus* (Say)

This species is separated from the two previous species by the size and number of tergal setae in both sexes.

MALE. As shown in Pl. 5, fig. 2. Except for size and shape, characters of head as in *A. lacustris* sp. n. Thorax and abdomen similar to that of *A. lacustris*, but the prosternal plate has no anterior median projection and is usually pointed posteriorly, although this last character may also occasionally be found in *A. lacustris*. Density and size of tergal setae as in Pl. 5, fig. 5. Last segment with anterior dorsal setae. Genital sclerite (Pl. 11, fig. 4) rather longer than in *lacustris*.

FEMALE. Head and thorax as in male. Tergal setae more numerous than in the last two species, the allotype, for instance, has the following number of tergo-central setae: I, 7; II, 10; III–V, 12; VI, 13; VII, 12; VIII, 6. Last segment with anterior dorsal setae. Measurements of both sexes in Table VII.

MATERIAL EXAMINED. 56 ♂, 45 ♀ from *Limnodromus griseus scolopaceus* (Say) from California and from *Limnodromus griseus* from South Carolina.



FIGS. 51-54. Third tibia. Figs. 51-52. *A. crinitus*. 51. Dorsal. 52. Ventral. Figs. 53-54. *A. tetralicis*. 53. Dorsal. 54. Ventral. d.—7 outer latero-dorsal setae; v.—3 outer latero-ventral setae.

Holotype ♂ and *allotype* ♀ slide No. 12734a in the Meinertzhagen collection, British Museum (Natural History), from *Limnodromus griseus scolopaceus*, California, March, 1939. *Paratypes*: 55 ♂, 44 ♀ from *Limnodromus griseus* with data as given above.

Actornithophilus kilauensis (Kellogg & Chapman, 1902)

Carriker (1957 : 103-104) in his notes on the Kellogg types in the Natural History Museum of Stanford University, mentions under this name a single female on slide 1210a which he considers automatically becomes the type of the species. Through the kindness of Dr. Paul Ehrlich, I have been able to see this slide. It is labelled "*Colp. n. sp. near timidum* (smaller). *Heteractitis incanus*. Hilo. 1901". It also has "1210a", "fig. ♀" and "desc" in pencil; it is labelled type. There is little doubt that it is one of the specimens referred to in the original description of *kilauensis* as the host and locality are correct and the species was said to resemble *timidum*. I have added a lectotype label to the slide with the specific name *kilauensis* (which otherwise does not appear) and the reference to Carriker, 1957. The specimen is in rather poor condition and has lost most of the setae, and although it is possible to see the number and position of these by their alveoli, nothing can be told of their length. According to the label, this was the figured specimen, but it does not in fact agree with pl. 14, fig. 1 (in Kellogg & Chapman, 1902) nor with the description, as the abdominal tergites of the specimen have a single line of marginal setae and not "numerous non-pustulated hairs scattered irregularly over the dorsal surface" and the last segment has no anterior dorsal setae. It is possible that the sternal setae have been shown on the dorsal surface or the description was made from a male which probably has anterior tergal setae. Unfortunately, no other specimens are available from the type host.

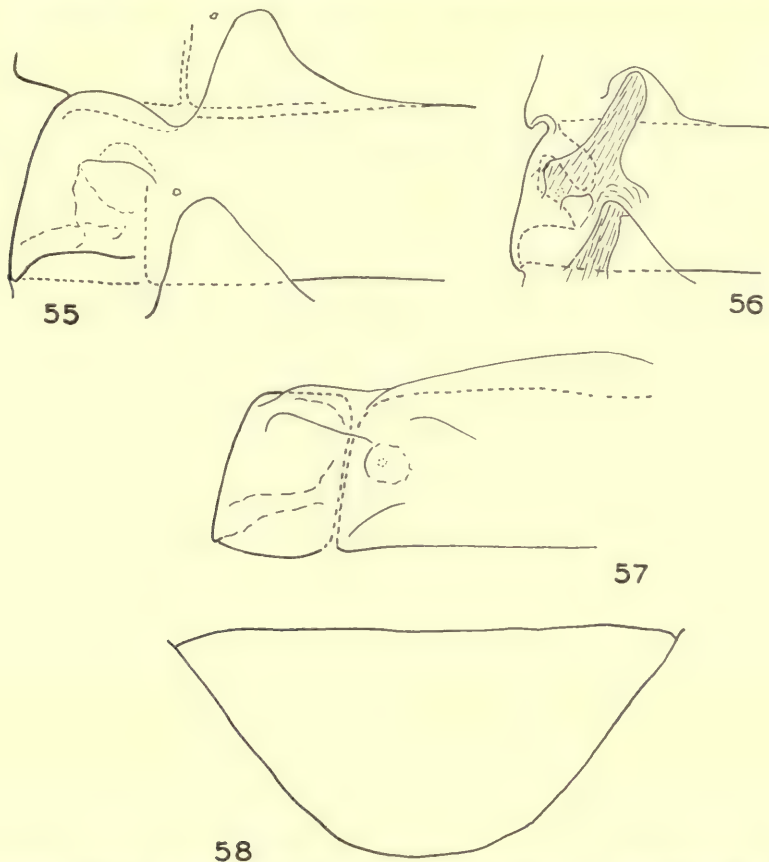
FEMALE. Shape of head as in Pl. 4, fig. 6. Dorsal prothoracic seta 1 small; all the marginal prothoracic setae are broken, but the alveoli of 5 are not as small as in those species where this seta is short and fine; prosternal plate partly hidden but probably surrounds setae, not strongly pointed posteriorly. Mesosternum: 5 setae; metasternum: 10; abdominal sternum I: 3 setae; II-III: 2 rows; IV-VII: 3 sparse rows. Brushes on IV with 23 and ? 22. Last sternites joined narrowly as in Text-fig. 71. The metanotum has no long anterior setae, marginal metathoracic seta 2 short but not fine. Tergites I-VIII with setal pattern A; III has 1 anterior seta; last segment without anterior dorsal setae. All the post-spiracular setae are broken. Measurements in mm.: breadth of head at temples: 0.460; length of head: 0.340; breadth of prothorax: 0.315; metathorax: 0.400; breadth of abdomen: 0.565; length of abdomen: 1.080; total length: 1.765.

Subdivision III

The populations parasitic on the species of *Limosa* resemble each other within the *umbrinus* group by the following characters: the prosternal plate does not surround the prosternal setae; there are no long anterior setae on the metanotum, the tergites do not have well developed internal anterior processes; the males have anterior dorsal setae on the last segment and the tergal setae do not show pattern A.

Specimens have been seen from three species of *Limosa*: *L. limosa*, the type host of *A. spinulosus* (Piaget); *L. lapponica*, the type host of *A. limosae* (Kellogg) and *Limosa fedoa*. The males of *spinulosus* are at once distinguished from those of

limosae by the more numerous tergal setae but males from *Limosa fedoa* are intermediate between the two species in this character. Considering the males alone it might appear to be more convenient to include the populations from the three hosts under one name. The females, however, fall into two well-marked groups. Those of *limosae* and the population from *L. fedoa* have setal pattern A on seven to



FIGS. 55-58. Tergite IV to show internal anterior process. 55. *A. ochraceus*, segment opened out to show internal view. 56. *A. ochraceus*, as seen in whole mount. 57. *A. umbrinus*, internal view. 58. *A. tetralicis*, outline of last segment of ♀ abdomen.

five (rarely four) of the tergites and always on VII, whereas those of *spinulosus* have setal pattern A usually on only two (rarely three) tergites and never on VII. The females of *spinulosus* are also distinguished from those of *limosae* and the population on *L. fedoa* by the sternal thickening of the penultimate segment, which although showing individual variation in the exact outline, is separated into two sclerites (Text-figs. 67 and 68). The males of *spinulosus* can also be distinguished from the populations from the other two hosts by the size of the stout submarginal tergal setae relative to the rest of the tergal setae (Pl. 8, figs. 1-3). The following table

gives the mean head breadth of *Actornithophilus* specimens from the three species of *Limosa* and the crude mean of the wing lengths of the hosts arranged in order of the density of the tergal chaetotaxy, *A. limosae* having the smallest number of setae :

Parasite	Host	Mean head breadth of parasite (mm.)	Wing length (mm.)
<i>A. limosae</i>	<i>L. lapponica</i>	0.53 (9)	214
- - - - -	<i>L. fedoa</i>	0.56 (16)	225
<i>A. spinulosus</i>	<i>L. limosa</i>	0.53 (5)*	221

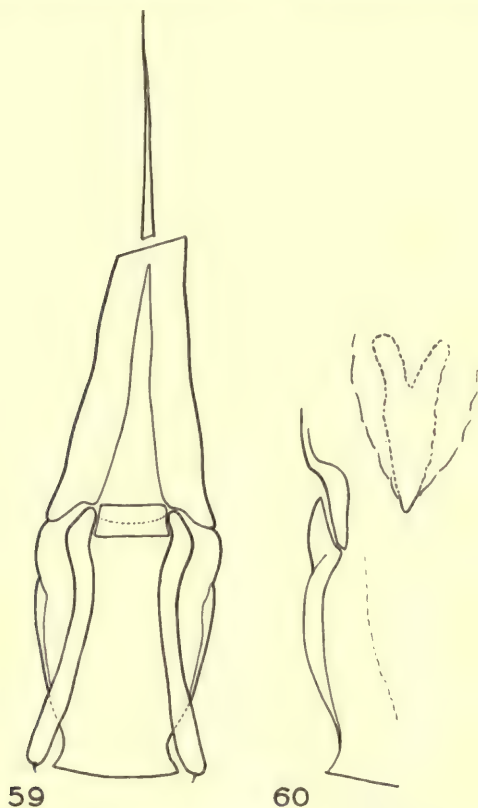
*This does not include the male lectotype, which although typical of the other specimens from *L. limosa* has a head breadth of 0.57 mm. The female paratype is also rather larger than the average; this may partly be due to overtreatment of the specimens with KOH.

Although the numbers, especially in the case of *spinulosus*, are small it appears that specimens from one of the larger hosts (*L. limosa*) do not average larger than those on the smallest host (*L. lapponica*), although they show an increase in the number of setae. Whereas in the case of specimens from the other larger host, *L. fedoa*, the specimens average larger than those from *A. lapponica* and also show an increase in the number of setae, this agrees with the rule usually found in related populations of *Actornithophilus*. The fact that specimens from *L. limosa* do not, on the evidence of present material, appear to follow this rule suggests that the population from this host may be less nearly related than are those on the other two hosts. Considering all these facts it is here decided to place the populations from *L. lapponica* and *L. fedoa* together under the name *limosae* in spite of differences in the density of the tergal setae in the male, and to recognize the population from *L. limosa* as a separate species, *A. spinulosus*. It is of interest that in *Austromenopon* the reverse is the case, the species parasitic on *L. fedoa* being the same as that on *L. limosa*, namely *A. limosae* Timmermann.

The *grandiceps* Group

This is a distinct group differing from all other known species from the Charadrii in that the majority of specimens do not have setal pattern A on the posterior dorsal margin of the metathorax (having a greater number of central setae), and by the females having two to three inner posterior setae each side of the last abdominal segment (Text-fig. 66). Timmermann (1954 : 836) is here followed in including the population from *Ibidorhynchus struthersii* under the name *A. grandiceps* (Piaget). Specimens (17 ♂, 18 ♀) collected from skins of this host from India, Tibet, Szechwan and N. Kansu have been seen. These are mostly in rather poor condition and it has not been possible to check the variation of certain characters in which they appear to differ from *A. grandiceps* from *Haematopus*. These are possibly the proportions of the head and last abdominal segment of the female, and the greater length of post-spiracular seta V relative to II in the females, but there are few specimens in which these setae are unbroken. The shape and size of the prosternal plate in specimens from both *Haematopus* and *Ibidorhynchus* vary considerably due to the degree of pigmentation of the plate. The mean of the number of tergoventral setae of the meta-

thorax is greater in specimens from *Ibidorhynchus*: in the 17 males examined only one specimen (in poor condition) probably had six central setae, the rest ranged from 9–15, with a mean of 10.59; a sample of 18 of *grandiceps* ranged from six (one specimen) to 11, with a mean of 8.72. The 18 females had a range of six (two



FIGS. 59–60. *A. totani*, male genitalia. 59. Ventral. 60. Dorsal.

specimens) to 16 tergocentral setae and a mean of 10.72; in 18 specimens of *grandiceps sens. str.*, one specimen had six setae, the range was 6–11 and the mean 8.47.

The *pediculoides* Group

This group contains two species: *A. pediculoides*, the systematic position of which has been discussed above (p. 191), and *A. sabulosus* sp. n. They resemble each other in the shallow preocular notch and reduction of the preocular nodi, in the small size of dorsal head setae *e*, the reduction of the prosternal plate, the rather sparse ventral chaetotaxy of the abdomen and the shape of the posterior margin of the mesosomal plate. The head is narrow at the temples in *pediculoides*, in which character it resembles *erinaceus*, and rather less so in *sabulosus*. It is difficult

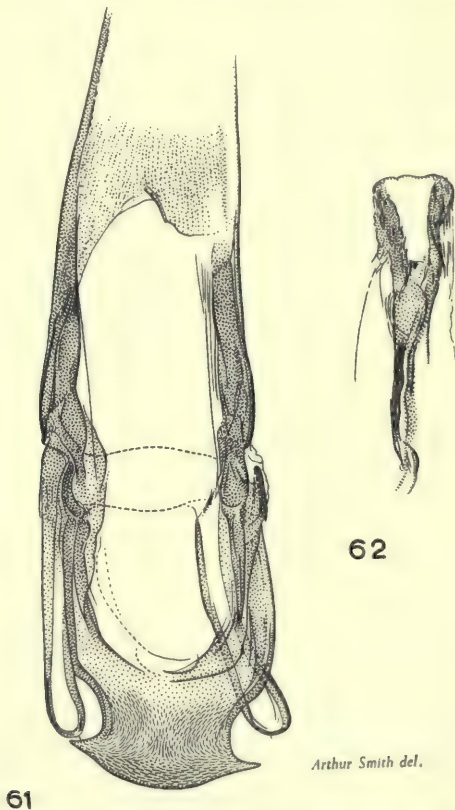
to say whether the two species are, in fact, related or only resemble each other due to some similarity of their habitats, perhaps both living in the quills as suggested above (p. 192).

***Actornithophilus sabulosus* sp. n.**

Type host : *Charadrius hiaticula semipalmatus* Bonaparte

(Pl. 4, fig. 3, Pl. 9, fig. 1 ; Text-figs. 7, 12, 18, 61, 62)

This species is distinguished from *pediculoides* by the shape of the head, prosternal plate and the size of marginal prothoracic setae 1 and dorsal prothoracic setae 1.



FIGS. 61-62. *A. sabulosus* sp. n. 61. Male genitalia, ventral. 62. Sclerite of genital sac.

MALE. General characters as shown in Pl. 4, fig. 3. Relative sizes of dorsal head setae e., dorsal prothoracic setae 1 and marginal prothoracic setae 1 and 5 as in Text-fig. 7. Metanotum without long anterior setae ; in the single male marginal metathoracic setae 2 vary in length and thickness on the two sides of the body. Tergites I-VIII with setal pattern A ; IV, V, VI and VII have one or two anterior setae, last segment without anterior dorsal setae. Sternal setae rather sparse,

sternites I–VII with two rows of setae in centre of segment ; brush on IV as shown in Pl. 6, fig. 1. Ventral setae in the centre of the last segment eight in number and fewer than in the specimens of *pediculoides* examined, which have 10–14, but the number of setae here seems to be a variable character : two specimens of *A. ochraceus* from one host individual, for instance, have six and nine respectively. Genitalia as in Text-figs. 61–62.

FEMALE. Characters of head, thorax and chaetotaxy of tergites I–VIII as described for male except that there are seven mesosternal setae and nine metasternal. Sternites I–VII as described for male but there are three to four more setae in the brushes on segment IV. Last segment without anterior dorsal setae.

MATERIAL EXAMINED. 1 ♂, 1 ♀ from *Charadrius hiaticula semipalmatus* from Churchill, Manitoba, Canada, 17. vi. 1934.

Holotype male and *allotype* female, slide No. 659 in the British Museum (Natural History) presented by Mr. G. H. E. Hopkins from *Charadrius hiaticula semipalmatus* Bonaparte with data as given above.

Measurements in mm.				
	Male		Female	
	Length	Breadth	Length	Breadth
Head (B.1)	0.355	0.410	0.380	0.410
(B.2)	—	0.330	—	0.330
Prothorax	—	0.330	—	0.325
Metathorax	—	0.430	—	0.440
Abdomen	1.460	0.580	1.540	0.600
Total	2.180	—	3.290	—

TABLE I.—Breadths and Lengths of Male Head in mm. of *A. umbrinus* Populations from Various Hosts, with Ratio of Length of Head (L) to Breadth 1 and Crude Mean Wing Length in mm. of Male Hosts

Host	Head of parasite						Wing length of male host (Crude mean)
	Breadth 1		Breadth 2		Length		
	Range	Mean	Range	Mean	Mean	$\frac{L}{B.1}$	
<i>Erolia subminuta</i> (2)	0.375-0.390	0.382	0.310	—	—	—	94
<i>E. minutilla</i> (20)	0.395-0.440	0.410	0.310-0.330	0.316	0.321	0.780	87
<i>E. minuta</i> (5)	0.395-0.460	0.420	0.310-0.340	0.326	0.329	0.785	96
<i>Ereunetes mauri</i> (8)	0.405-0.440	0.420	0.315-0.335	0.322	—	—	94.6*
<i>Erolia alpina</i> (22)	0.420-0.495	0.450	0.325-0.370	0.345	0.332	0.740	108
<i>Erolia testacea</i> (7)	0.420-0.480	0.448	0.320-0.355	0.344	0.336	0.750	129
<i>Erolia fuscicollis</i> (8)	0.415-0.475	0.451	0.330-0.360	0.350	—	—	119.7*
<i>Crocethia alba</i> (6)	0.450-0.480	0.460	0.340-0.370	0.350	0.337	0.730	123
<i>Micropalama himantopus</i> (3)	0.450-0.475	0.465	0.345-0.360	0.365	—	—	124.4*
<i>Philomachus pugnax</i> (11)	0.490-0.540	0.520	0.370-0.400	0.386	0.350	0.675	192
<i>Calidris canutus</i> (7)	0.510-0.550	0.530	0.390-0.420	0.405	0.367	0.690	166

B.1, breadth at temples ; B.2, breadth at preocular enlargement. Number of parasites measured in brackets.

*Average wing length as given in Ridgeway, 1919, *The Birds of North & Middle America*, vol. VIII.

TABLE II.—*Range of Tergal Setae of Male A. totani from Tringa totanus*

Anterior tergal setae†		Tergocentral setae†
Segment	Range of 35 ♂	range
I	1-5 .	4-7
II	3-7 .	6-12
III	3-11 .	8-22
IV	2-16 .	10-24
V	5-22 .	15-25
VI	9-20 .	15-25
VII	7-21 .	11-18
VIII	8-17 .	7-8
IX-XI*	2-12 .	—

†Numbers given in column under Anterior tergal setae are the number of setae (alveoli) in a square 0.11 × 0.11 mm. in the centre of the tergite omitting the marginal and large submarginal setae. The tergo-central setae are the small marginal and the larger slightly submarginal setae omitting the post-spiracular and the seta next to it.

*Total number of dorsal anterior setae omitting the two long setae found on all species of *Actornithophilus*.

TABLE III.—*Mean and Range in mm. of Breadth of Head at Temples of Male A. totani from Tringa totanus from Various Localities*

Mean	Range	Number of specimens	Number of hosts	Locality	Host subspecies
0.513	0.480-0.550	11	2	Estonia	<i>t. totanus</i> .
0.502	0.455-0.530	6	4	Iceland, S. Uist	<i>t. robusta</i> .
0.497	0.490-0.505	2	1	E. Scotland	<i>t. subsp. ?</i>
0.488	0.480-0.495	3	1	Morocco	<i>t. totanus</i> .
0.468	0.455-0.480	3	3	British Isles	<i>t. totanus</i> .
0.457	0.450-0.465	2	2	Ireland	<i>t. subsp. ?</i>
0.456	0.445-0.465	6	4	India, Ceylon, Sudan	<i>t. eurhinus</i> .
0.455	0.450-0.460	2	2	British Isles	<i>t. britannica</i> .

TABLE IV.—*Measurements in mm. of Breadth of Head at Temples (1) and at Preocular Enlargement (2) of A. totani from Various Species of Tringa*

Male					
Host	Breadth 1		Breadth 2		
	Range	Mean	Range	Mean	
<i>Tringa totanus</i> * .	0.45-0.53	0.49 (38)	0.33-0.38	0.36 (39)	
<i>T. erythropus</i> (4) .	0.47-0.50	0.48	0.34-0.36	0.35	
<i>T. stagnatilis</i> .	0.42-0.45	0.45 (6)	0.32-0.34	0.33 (4)	
<i>T. flavipes</i> (10) .	0.41-0.47	0.45	0.31-0.35	0.33	
<i>T. glareola</i> (8) .	0.40-0.48	0.44	0.29-0.36	0.32	
Female					
<i>Tringa totanus</i> (40) .	0.48-0.57	0.52	0.35-0.41	0.38	
<i>T. erythropus</i> (4) .	0.49-0.52	0.51	0.36-0.38	0.37	
<i>T. stagnatilis</i> (5) .	0.46-0.49	0.47	0.35-0.36	0.35	
<i>T. flavipes</i> (10) .	0.47-0.50	0.48	0.34-0.36	0.35	
<i>T. glareola</i> † (16) .	0.43-0.50	0.45	0.32-0.36	0.33	

*See also Table III.

†Mean of breadth 1 of 10 specimens from the Sudan is 0.44 and of the remaining 6 from other localities is 0.47, the corresponding figures for breadth 2 are: 0.329 and 0.345; there are no males from the Sudan.

TABLE V.—Measurements in mm. of *Actornithophilus* Species

	Male									
	<i>totani</i>		<i>flumineus</i>		<i>paludosus</i>		<i>lacustris</i>		<i>limarius</i>	
	Length	Breadth	Length	Breadth	Length	Breadth	Length	Breadth	Length	Breadth
Head	0.360	0.500	0.350	0.430	0.340	0.455	0.375	0.550	0.320	0.465
B.2	—	0.365	—	0.340	—	0.340	—	0.390	—	0.330
Prothorax	—	0.350	—	0.310	—	0.325	—	0.390	—	0.340
Metathorax	—	0.450	—	0.415	—	0.390	—	0.500	—	0.425
Abdomen	1.170	0.550	0.970	0.490	1.000	0.470	1.310	0.605	1.155	0.550
Total	1.930	—	1.700	—	1.680	—	2.120	—	1.850	—

Female										
Head	0.370	0.520	0.370	0.470	0.350	0.490	0.380	0.535	0.350	0.490
B.2	—	0.385	—	0.360	—	0.360	—	0.380	—	0.350
Prothorax	—	0.365	—	0.330	—	0.335	—	0.370	—	0.350
Metathorax	—	0.510	—	0.480	—	0.435	—	0.500	—	0.480
Abdomen	1.490	0.700	1.300	0.640	1.420	0.610	1.450	0.730	1.380	0.665
Total	2.690	—	2.080	—	1.975	—	2.230	—	2.120	—

TABLE VI.—Measurements of Breadths of Head (in mm.) of *A. paludosus* from *Tringa nebularia* from Various Localities and from *T. melanoleuca*

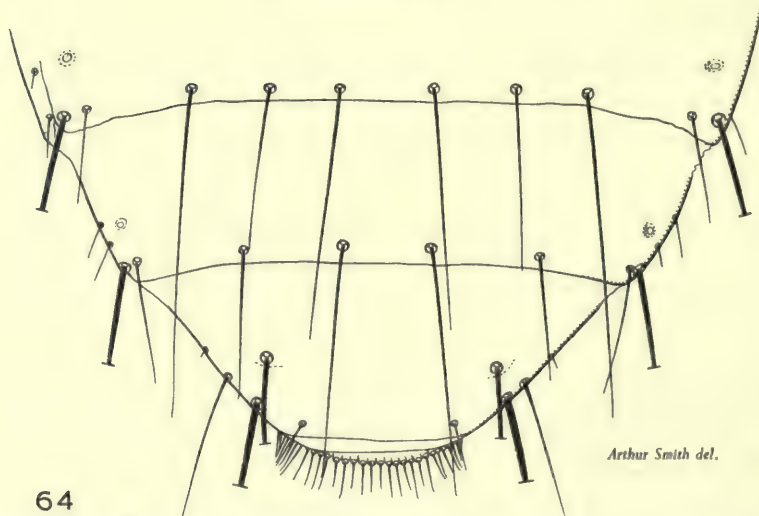
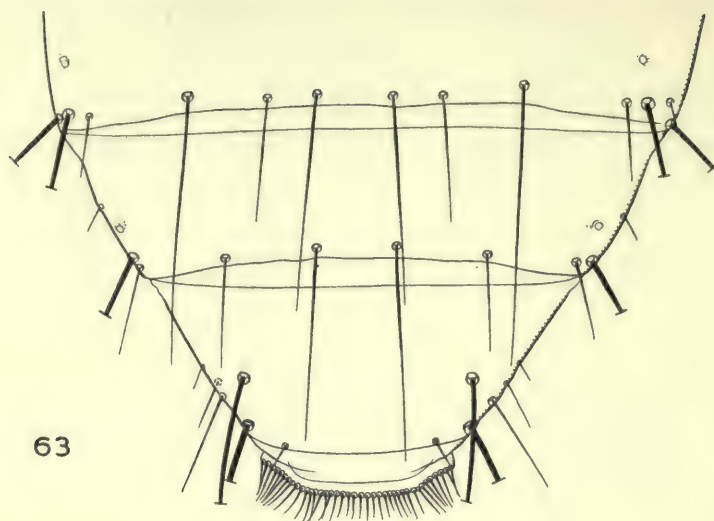
Host	Locality	Male			
		Breadth 1		Breadth 2	
		Range	Mean	Range	Mean
<i>T. nebularia</i>	Port Sudan and Aden (4)	0.434–0.450	0.446	0.310–0.340	0.327
	Czechoslovakia (6)	0.500–0.520	0.504	0.355–0.360	0.360
<i>T. melanoleuca</i>	N. America	0.480–0.535	0.509	0.345–0.375	0.359

Female					
<i>T. nebularia</i>	Port Sudan and Aden (8)	0.460–0.490	0.476	0.340–0.360	0.354
	Czechoslovakia (7)	0.500–0.550	0.517	0.360–0.380	0.368
<i>T. melanoleuca</i>	N. America	0.470–0.550	0.511	0.350–0.385	0.364

TABLE VII.—Measurements in mm. of Breadths of Heads of *Actornithophilus* sp.

	Male			
	Breadth 1		Breadth 2	
	Range	Mean	Range	Mean
<i>A. flumineus</i> (7)	0.40–0.45	0.43	0.31–0.34	0.33
<i>A. lyallpurensis</i> (5)	0.43–0.46	0.44	0.31–0.33	0.32
<i>A. lacustris</i> (10)	0.52–0.55	0.54	0.37–0.41	0.39
<i>A. limarius</i> (20)	0.46–0.48	0.47	0.33–0.35	0.34

Female			
<i>A. flumineus</i> (11)	0.44–0.49	0.47	0.34–0.37
<i>A. lyallpurensis</i> (9)	0.45–0.49	0.47	0.33–0.35
<i>A. lacustris</i> (10)	0.53–0.56	0.55	0.38–0.41
<i>A. limarius</i> (20)	0.48–0.50	0.49	0.34–0.36

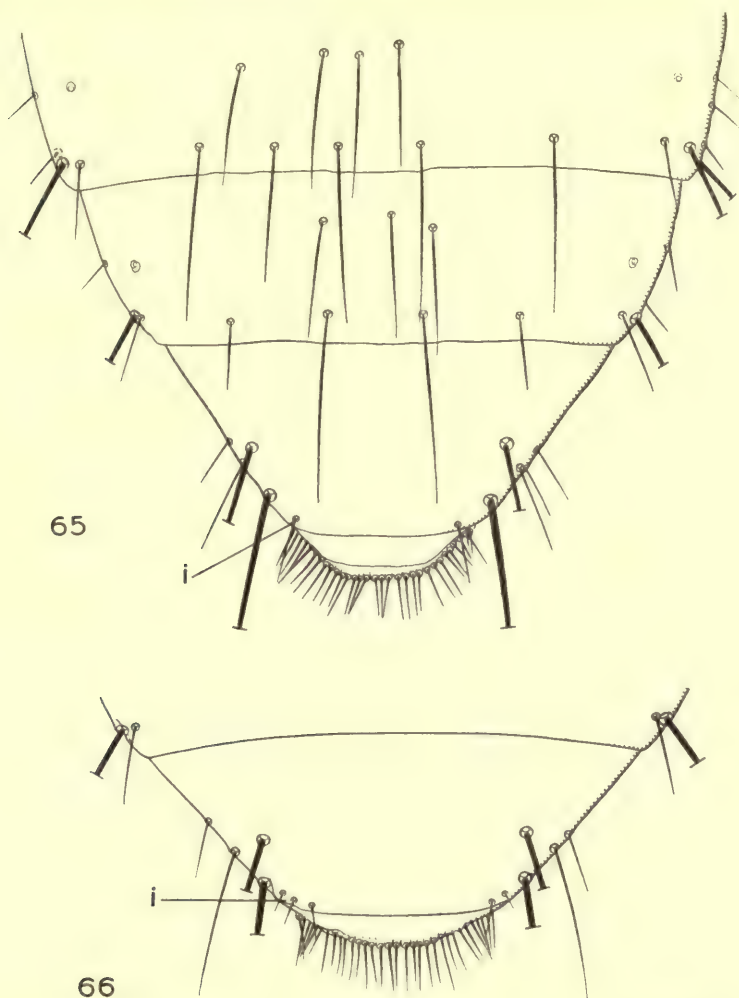


FIGS. 63-64. Posterior tergites of female abdomen. 63. *A. ochraceus* from type host. 64. *A. sedes*.

NOTES ON THE INTERPRETATION OF CERTAIN NAMES

Actornithophilus perplanus (Kellogg & Chapman, 1899)

This species was based on a single specimen taken from one of the Alcae, *Lunda cirrhata*; the type specimen on slide 543b (see Carriker, 1957 : 104) has been seen and is a female belonging to the *ochraceus* group. Its size suggests that it originated from one of the larger Charadriinae (*sens.* Peters, 1934) such as *Squatarola squatarola* or *Pluvialis dominica*. A specimen of *Actornithophilus* from the former host is referred to in the same paper on p. 112. Thus the name *perplanus* would become



Arthur Smith del.

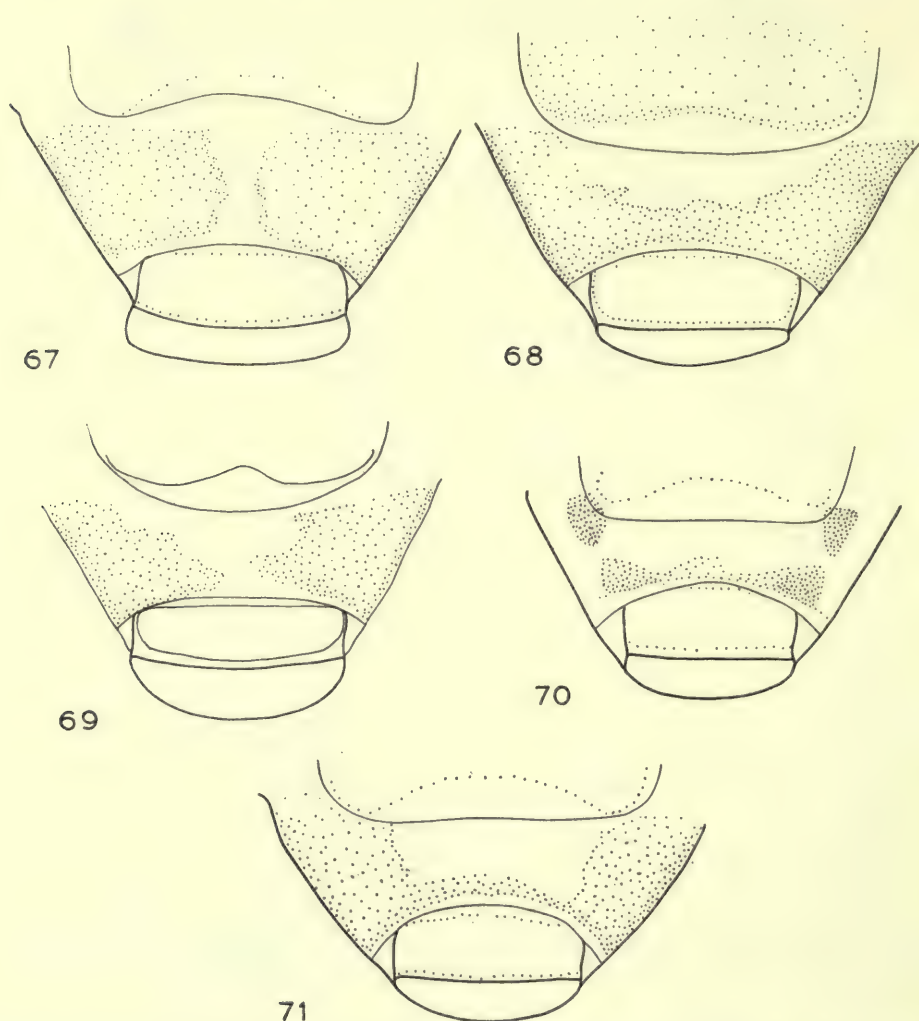
FIGS. 65-66. Posterior tergites of female abdomen. 65. *A. hoplopteri* from type host.
66. *A. grandiceps*. i.—inner posterior setae of last tergum.

a synonym of *flavipes* (Giebel, 1874), or *timidus* (Kellogg, 1896), if these were considered to be separable from *ochraceus* (Nitzsch, 1818), s. s., but as they have here been placed as synonyms of this latter name *perplanus* **syn. n.** becomes a synonym of *ochraceus*.

***Actornithophilus paetulus* (Kellogg & Kuwana, 1900)**

The description of this species was based on a single specimen, said to have been taken from *Arenaria interpres*, and which now cannot be found. It is difficult to

say what this specimen may have been, even whether it was a male or female, since it is referred to as a male in one place and a female in another. It has not been possible to find any *Actornithophilus* with long anterior setae on the metanotum and



FIGS. 67-71. Posterior sternites of female abdomen. 67. *A. spinulosus*. 68. *A. limosae*. 69. *A. umbrinus*. 70. *A. bicolor*. 71. *A. crinitus*.

with abdominal chaetotaxy as shown in the figure and with proportions of the head as given by the measurements. However, it may be an incorrectly figured specimen of the species normally found on *Arenaria*, that is *A. bicolor* (Piaget), but the name must remain a *nomen dubium* until the type specimen is found.

Colpocephalum subpustulatum Carriker, 1910

This species was based on a female from a kingfisher, *Ceryle alcyon*, and was almost certainly a straggler from one of the *Charadrii*. It is impossible to say what this specimen might have been as there is no *Actornithophilus* in which there is an

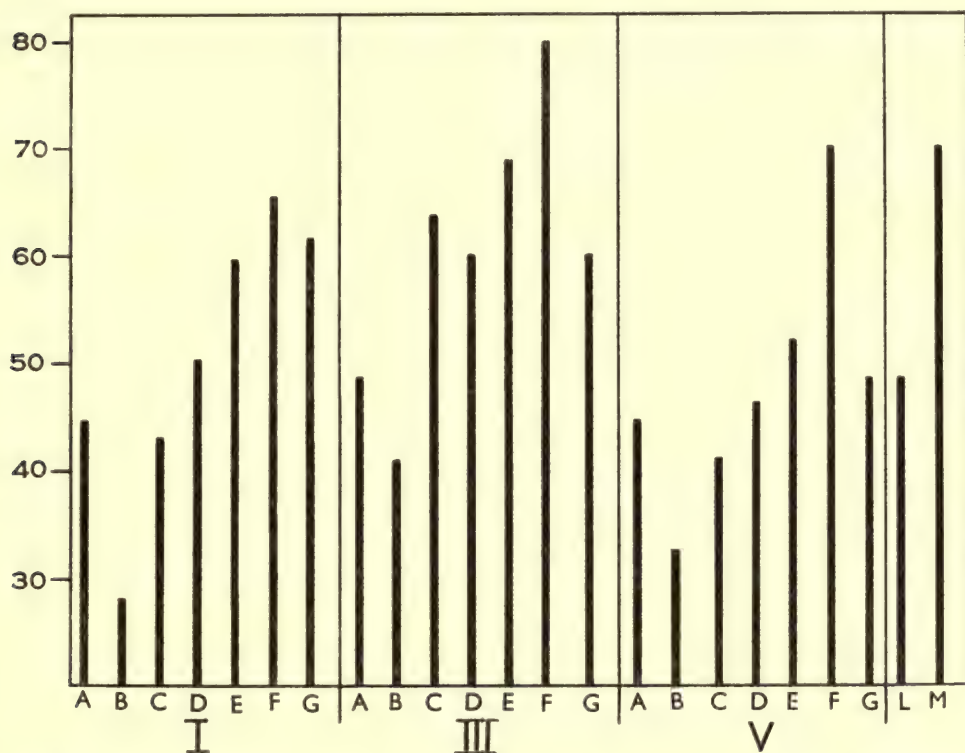


FIG. 72. Diagram showing relative lengths of post-spiracular setae I, III and V expressed as a percentage of II for individuals of species of *Actornithophilus*. A-G males of *Actornithophilus*: A. *ochraceus*; B. *hoplopteri*; C. *pauliani*; D. *himantopi*; E. *uniseriatus*; F. *tetracis*; G. *lacustris*. L-M. Post-spiracular seta III of females: L. *ardeolae*; M. *limosae*.

"absence of very long hairs on any portion of the body". It must therefore be presumed that the specimen was damaged and that the long setae were missing. If the "three irregular rows of fine short hairs" on the abdominal segments are dorsal, then the specimen might have belonged to the *umbrinus* species-group, if ventral possibly to the *ochraceus* group. However, without seeing the type specimen it is impossible to do more than guess about its identification.

***Actornithophilus tigrus* (Kellogg & Mann, 1912)**

The original description was based on material from *Arenaria melanocephala* and *Aphriza virgata*. Carriker (1957 : 104) designated *Arenaria melanocephala* as the type host, but did not select a lectotype from the three specimens on slide 48b from this host to which he refers. This slide has been seen and although labelled as three males, the specimens are in fact females. In the original description reference is also made to three males, but there is little doubt that these females are the original material as the description of the colour, dorsal chaetotaxy and the four small blotches on segment " eight " of the abdomen fits the female of this species but not the male ; it was also stated that the genitalia were not visible. This slide has now been remounted and one of the females labelled as lectotype of *A. tigrus*. Specimens from *Arenaria melanocephala* do not appear to be separable from the population on *A. interpres*, so *tigrus* **syn. n.** becomes a synonym of *bicolor* (Piaget).

***Actornithophilus scopularis* (Neumann, 1912)**

This was described from one male and two females taken from a *Passer domesticus* at Tring, England. The figure and description could apply to the *Actornithophilus* found on *Vanellus vanellus*, a likely bird to be found at Tring. However, the measurements given for the head do not seem to fit any species of *Actornithophilus* from the Charadrii either in actual measurements or in proportions ; the breadth of the head is similar to that of *grandiceps* from *Haematopus ostralegus* (not likely to be found at Tring), but the length is too great. Assuming that the measurements of the head are incorrect, it is possible that the specimens on which *scopularis* was based originated from *Vanellus vanellus* and were *A. gracile* (Paiget). However, unless the type is found this name must be considered a *nomen dubium*.

***Actornithophilus raviensis* Ansari, ? 1955**

Actornithophilus raviensis Ansari, ? 1955. *Proc. VIIth Pakistan Sci. Conf. (Agriculture)* : 55.

Host : *Himantopus h. himantopus*.

Actornithophilus raviensis Ansari, 1956. *Indian J. Ent.* **17** (1955) : 400. Host : *Ibid.*

Actornithophilus raviensis Ansari, 1957. *Ibid.* **18** (1956) : 434, figs. Host : *Ibid.*

This species was described as new in all the publications given above and the first date of publication is uncertain. However, the description and figures make it probable that this name is a synonym of *himantopi* Blagoveshtchensky, 1951 from the same host, but this would have to be confirmed by an examination of the type. The measurements given in the description of the female holotype are too small for *himantopi* unless the specimen was in a shrunken condition ; the fact that the anterior margin of the head is distorted supports the last suggestion as this form of distortion has been seen in other shrunken specimens. The characters of the dorsal chaetotaxy and the figure of the prosternal plate fit those of *himantopi*.

KEY TO *ACTORNITHOPHILUS*¹

- 1 Seta at base of labial palp shorter than palp (Text-fig. 24) ; dorsal head sensillus 4 and dorsal head seta *d* absent (Text-fig. 8) ; mesosternal plate with one central seta² (Text-fig. 21) ; 1st outer latero-ventral seta of tibia III short and fine 2
- Seta at base of labial palp twice or more length of palp (Text-fig. 23) ; d.h. sensillus 4 and d.h. seta *d* present (Text-fig. 4) ; mesosternal plate with 3 or more central setae (Text-fig. 22) ; 1st outer latero-ventral seta of tibia III not short and fine (Text-fig. 52) 4
- 2 (1) Dorsal prothoracic setae 1 and 2 present ; two inner posterior setae each side of last abdominal tergum ; lateral preocular margins of head approximately perpendicular ; ♂ with lateral head spines and asymmetrical genitalia 3
- D.p.s. 1 absent on at least one side ; one inner posterior seta each side of last abdominal tergum (as in Text-fig. 65) ; head and genitalia not as above
- piceus sens. lat.* (p. 201)
- 3 (2) Abdominal tergites I–VIII without row of anterior setae *ceruleus* (p. 201)
- At least 3 abdominal tergites with row or rows of anterior setae *incisus*
- 4 (1) Metanotum with long anterior setae (Text-fig. 47) 5
- Metanotum without long anterior setae (Text-fig. 46) 14
- 5 (4) Abdominal pleurites without pattern of internal thickening ; internal anterior processes undeveloped ; tergites with never more than one row of anterior setae ; tergum of last segment without anterior setae ; shape of head characteristic (Text-fig. 9). (Prosternal plate with 1–2 elongated setae) *patellatus*
- Without above combination of characters 6
- 6 (5) D.p.s. 1 relatively long and stout (Text-fig. 6) 7
- D.p.s. 1 short and fine (Text-fig. 4) 9
- 7 (6) ♂ tergites with row of stout elongated submarginal setae and rows of smaller setae (Pl. 4, fig. 3) ; ♀ penultimate sternite broad and interrupted medially (Text-fig. 69) 8
- ♂ tergites with setae all of the same type (Pl. 4, fig. 4) ; ♀ penultimate sternite narrow and continuous across segment (as in Text-fig. 71). (Hypopharyngeal sclerites and epipharyngeal crest reduced ; last tergum with anterior setae)
- multisetosus*
- 8 (7) Lingual sclerites and epipharyngeal crest reduced ; male genital sclerite as in Pl. 7, fig. 2 ; tergum of last segment of ♀ usually without anterior setae *pustulosus*
- Lingual sclerites and epipharyngeal crest not reduced ; male genital sclerite as in Pl. 7, fig. 1 ; tergum of last segment of ♀ with anterior setae
- umbrinus s. l.*
- 9 (6) Males 10
- Females 12
- 10 (9) Abdominal tergites I–VII with setal pattern A ; head nodi large (Text-fig. 29) ; tergum of last segment without anterior setae. (Internal anterior processes of tergites well developed) *gracilis*
- Without above combination of characters 11
- 11 (10) Size and number of tergal setae as in Pl. 2, fig. 4 ; head b.1 : 0.53–0.55, b.2 : 0.38–0.41 mm. ; male genital sclerite as in Pl. 8, fig. 5. Prosternal plate usually with anterior median projection (Text-fig. 20) *lacustris* sp. n. (Pl. 5, fig. 1)
- Size and number of tergal setae as in Pl. 2, fig. 6 ; head b.1 : 0.43–0.52, b.2 : 0.31–0.37 mm. ; male genital sclerite long, similar to Pl. 8, fig. 4
- paludosus* sp. n. (Pl. 5, fig. 3)

¹All species recognized are included with the exception of *A. stictus*, *A. ocellatus* and *A. subpustulatus*, of which no specimens have been seen.²Occasionally absent or two in number.

- Size and number of tergal setae as in Pl. 5, fig. 5; head b.1 : 0.46–0.48, b.2 : 0.33–0.35 mm.; male genital sclerite as in Pl. 11, fig. 4. (Prosternal plate without definite anterior median projection, tends to be pointed posteriorly) *limarius* sp. n. (Pl. 5, fig. 2)
- 12 (9) Tergite VII with setal pattern A; no anterior setae on last tergum 13
- Tergite VII with setal pattern otherwise; anterior setae on last tergum *limarius* sp. n.
- 13 (12) Head nodi large (Text-fig. 29); internal pleural thickening well developed and bilobed; prosternal plate surrounds setae; tergite VIII with sternal pattern A.1 *gracilis*
- Without above combination of characters *lacustris, paludosus* (p. 222)
- 14 (4) D.h.s. ϵ small (Text-fig. 7); pleurites without well-marked pattern of internal thickening; tergites I–VII with setal pattern A; posterior margin of mesosome with well-marked pointed projections each side (Text-fig. 59) 15
- Without above combination of characters 16
- 15 (14) Preocular emargination (Text-fig. 12) and prosternal plate (Text-fig. 18) characteristic; m.p.s. 1 and d.p.s. 1 long (Text-fig. 7) *sabulosus* sp. n. (Pl. 4, fig. 3)
- Preocular emargination (Text-fig. 14) and prosternal plate (Text-fig. 17) characteristic; m.p.s. 1 and d.p.s. 1 shorter (similar to Text-fig. 6) *pediculoides*
- 16 (14) Males 17
- Females 34
- 17 (16) Tergum of last abdominal segment without anterior setae 18
- Tergum of last abdominal segment with anterior setae 29
- 18 (17) Tergites VI and VII at least with tergal pattern A 19
- Tergites VI and VII with more central setae 28
- 19 (18) Preocular and occipital nodi small (as in Text-fig. 41); d.p.s. 1 minute (Text-fig. 4); sclerite in sac as in *A. totani* (Text-fig. 60). (Tergal setae each side of p.sp.s. of VIII long, central setae of tergite VIII long and stout; tergites II–VIII each with a well-marked row of anterior setae; leg setae sparse) *lyallpurensis*
- Without above combination of characters 20
- 20 (19) Setae of brush on 3rd femora and sternite IV (Pl. 9, fig. 5) numerous; latero-ventral setae of tibiae II–III: 3 long and 1–2 short and fine (Text-fig. 53); outer latero-dorsal tibial setae of III 7–9 (Text-fig. 54). Post-spiracular setae III and V not markedly shorter than II and IV (Text-fig. 72); male genital sclerite as in Pl. 10, fig. 6 *tetralicis* sp. n. (Pl. 4, fig. 2)
- Without above combination of characters 21
- 21 (20) Sclerite of genital sac as in Pl. 10, fig. 5. (Nodi well developed, Text-figs. 33–37, tergites I–VII with setal pattern A, VIII with A.1) 22
- Sclerite of genital sac otherwise (Pl. 10, figs. 3, 4) 23
- 22 (21) Prosternal setae not surrounded by prosternal plate; post-spiracular setae I and III (Text-fig. 72) and tergal setae longer than in *hoplopteri* (Pl. 7, fig. 2) *pauliani*
- Prosternal setae surrounded by prosternal plate; post-spiracular setae I and III (Text-fig. 72) and tergal setae shorter (Pl. 7, fig. 1) *hoplopteri* s. l.
- 23 (21) Preocular enlargement with 3–4 setae on both sides of head (Text-fig. 4). Two or more tergites with row of anterior setae; tergal setae rather short and stout; sclerite of genital sac as in Pl. 10, fig. 4. *crinitus* sp. n. (Pl. 4, fig. 1)
- Without above combination of characters 24
- 24 (23) M.p.s. 5 (Text-fig. 5) and m.m.s. 2 (Text-fig. 46) usually not short and fine; d.p.s. 1 not minute (cf. Text-figs. 5 and 4); inner tergo-central setae of II–VI markedly shorter than the outer setae (Text-fig. 49); p.sp.s. III relatively longer than that of *ochraceus* and *hoplopteri* (Text-fig. 72) 25
- Without above combination of characters 27

- 25 (24) D.h.s. *a* spine-like ; head as in Pl. 6, fig. 2 **mexicanus**
 — D.h.s. *a* not spine-like 26
- 26 (25) At least one tergite normally with 7 or more central setae. Head as in
 Pl. 6, fig. 1 **uniseriatus**
 — All tergites normally with 6 central setae. Head as in Pl. 6, fig. 3 **himantopi**
- 27 (24) Sides of abdomen rounded and shape of head as in Pl. 4, fig. 4 ; sclerite of
 genital sac as in Pl. 11, fig. 2 **sedes**
 — Sides of abdomen more parallel and shape of head as in Text-fig. 2 ; genital
 sac as in Pl. 10, fig. 3 **ochraceus sens. lat.**
- 28 (18) Tergite I with one marginal row of setae and sometimes 1-2 anterior setae ;
 metanotum with marginal setal pattern A ; head as in Pl. 7, fig. 5 **ardeolae**
 — Tergite I with one marginal and one anterior row of setae ; metanotum with
 marginal pattern usually otherwise **grandiceps**
- 29 (17) Tergites I-VII with tergal pattern A ; head as in Pl. 4, fig. 5 **flumineus** sp. n.
 — Tergites I-VII with setal pattern otherwise 30
- 30 (29) Pleurites narrow ; shape of head as in Text-fig. 13 **erinaceus**
 — Not as above 31
- 31 (30) Tergites II-VIII with 2 submarginal setae each side (excluding the p.sp.s.)
 considerably longer and stouter than marginal row (Pl. 9, fig. 6) ; prosternal
 setae not surrounded by prosternal plate ; sclerite of genital sac distinctive
 (Pl. 11, fig. 3) **bicolor**
 — Without above combination of characters 32
- 32 (31) Prosternal setae surrounded by prosternal plate ; genital sclerite short (Text-
 fig. 60) ; usually not more than 4-5 mesosternal setae **totani** (Text-fig. 3)
 — Without above combination of characters 33
- 33 (32) Stout submarginal setae of tergite VIII thicker relative to rest of dorsal setae,
 number of fine marginal setae greater (Pl. 8, fig. 3) than in *limosae* **spinulosus**
 — Stout submarginal setae of tergite VIII less thick relative to rest of dorsal
 setae, number of finer marginal setae less (Pl. 8, figs. 1 and 2) **limosae s. l.**
- 34 (16) Temples scarcely expanded (as in ♂, Text-fig. 13) ; pleurites with stout spines.
 (Tergites I-VIII with setal pattern A and one anterior row of setae) **erinaceus**
 — Without above combination of characters 35
- 35 (34) Prosternal setae not surrounded by prosternal plate ; sclerites of genital region
 characteristic (Text-fig. 70) ; m.m.s. 2 stout ; tergites I-VIII with setal
 pattern A, VIII occasionally has A.1, no rows of anterior setae **bicolor**
 — Without above combination of characters 36
- 36 (35) Tergite VII with 8 or less central setae 38
 — Tergite VII with 10 or more central setae. (At least 5 tergites with anterior
 setae) 37
- 37 (36) Head nodi small (Text-fig. 45) ; metanotum with marginal setal pattern A ;
 last tergum with one inner posterior seta **spinulosus**
 — Head nodi larger (Text-fig. 44) ; metanotum with marginal setal pattern usually
 otherwise ; last tergum with 2-3 inner posterior setae (Text-fig. 66) **grandiceps**
- 38 (36) Head nodi of medium size (Text-fig. 43) ; d.p.s. 1 rather stout ; m.p.s. 5 elongate,
 m.m.s. 2 stout ; at least 3 tergites with more central setae than in pattern A,
 at least 4 tergites with an anterior row of setae ; shape of head as in Text-fig.
 11 **ardeolae**
 — Without above combination of characters 39
- 39 (38) Mesosternum with 7-11 setae ; prosternal setae not surrounded by prosternal
 plate ; head nodi small (Text-fig. 42) ; shape of head as in Text-fig. 10. At
 least 3 tergites with a row of anterior setae **limosae s. l.**
 — Without above combination of characters 40
- 40 (39) Head nodi small (Text-fig. 41) 41
 — Head nodi not small (Text-figs. 25-40) 43

41 (40)	Tergites without anterior setae	<i>kilauensis</i>	
—	Tergites with anterior setae on at least 3 segments		42
42 (41)	Prosternal setae not surrounded by prosternal plate	<i>paludosus</i> sp. n. (p. 222)	
—	Prosternal setae surrounded by prosternal plate (Text-fig. 15)		
		<i>totani</i> group (p. 215)	
43 (40)	Preocular enlargement with 3-4 setae on both sides of the head (Text-fig. 4) ; (Tergites I-VII with setal pattern A, VIII with setal pattern A.1 ; anterior setae on some tergites)	<i>crinitus</i> sp. n.	
—	Without above combination of characters		44
44 (43)	Setae of brush on 3rd femora and sternite IV (Pl. 9, fig. 5) and outer lateral margins of tibiae more numerous than in the following species ; outer latero- ventral setae of tibiae II-III : 3 long and 1-2 short and fine, outer latero- dorsal setae : 7-10 (Text figs. 53-54). P.sp.s. III and V not markedly shorter than II. Shape of head as in male (Pl. 4, fig. 2)	<i>tetralicis</i> sp. n.	
—	Without above combination of characters		45
45 (44)	Tergites I-II, VI-VII at least, usually with setal pattern A, total central setae on tergites II-VII less than 44, known range 36-39		47
—	Tergites II-VI at least with more central setae, total central setae of tergites II-VII more than 44, known range 48-54		46
46 (45)	Breadth of head, known range : 0.57-0.61 mm.	<i>uniseriatus</i>	
—	Breadth of head, known range 0.50-0.51 mm.	<i>mexicanus</i>	
47 (45)	D.p.s. 1 rather stout (as in Text-fig. 5) ; p.m.s. 5 elongated ; m.m.s. 2 rather stout ; head shape as in ♂ (Pl. 6, fig. 3)	<i>himantopi</i>	
—	Without above combination of characters		48
48 (47)	Prosternal setae not surrounded by prosternal plate. (At least 3 tergites with row of anterior setae)	<i>pauliani</i>	
—	Prosternal setae surrounded by plate		49
49 (48)	Outer tergocentral setae of VII reach nearly or to end of abdomen, shape of last segment as in Text-fig. 64 ; sides of abdomen rounded	<i>sedes</i>	
—	Outer tergocentral setae of VII shorter, shape of last segment as in Text-figs. 63, 65 ; sides of abdomen more parallel		50
50 (49)	Anterior edge of preocular nodus usually straighter (Text-figs. 33-37) ; outer tergocentral setae of VIII short (Text-fig. 65)	<i>hoplopteri</i> s. l.	
—	Anterior edge of preocular nodus usually indented (Text-figs 25-28) ; outer tergocentral seta of VIII longer (Text-fig. 63)	<i>ochraceus</i> s. l.	

GLOSSARY

Anterior tergal setae. The setae anterior to the row along the posterior margin of the tergite (Text-fig. 50, *a*) ; in the key the term is used for the setae in the centre of the segment as laterally there may be extra setae when centrally there is only one row. The anterior setae of the last tergum are the shorter setae anterior to and level with the long lateral setae always found on the dorsal surface of the last abdominal segment in both sexes. The long anterior setae of the metanotum are the longer setae found in the central area of the metanotum in some species (Text-fig. 47, *a*).

Breadth of the head ; b.1 and b.2. B.1 = breadth at temples, b.2 = breadth at preocular enlargement.

Dorsal head sensilli (d. h. sens.) 1-4. These have been discussed elsewhere (Clay, 1961) and are shown here in Text-fig. 4.

Dorsal head setae (d. h. s.) a-f. These setae may show useful taxonomic characters (Text-fig. 4).

Dorsal prothoracic seta (d. p. s.) 1-2. See Text-fig. 4.

Inner posterior setae of last tergum. In most of the species of *Actornithophilus* there is one short seta each side of the posterior margin of the last tergum of the female (Text-fig. 65); in *A. grandiceps* (Text-fig. 66) there are two to three each side, although the occasional specimen may have only one.

Internal anterior process of tergite. The size of this varies considerably in different species (Text-figs. 55-57 and Pl. 7, fig. 1).

Male genital sclerite. The sclerite in the genital sac of the male genitalia, the form of which may be of taxonomic value (Pls. 10 and 11).

Marginal prothoracic seta 5 (m. p. s. 5). Although this seta tends to show individual variation in length and thickness, in some species it is normally short and fine and in others longer and stouter (Text-figs 4 and 5). This also applies to m.m.s. 2 see below.

Marginal metathoracic seta 2 (m. m. s. 2). See above under m.p.s. 5 and Text-figs. 46 and 47.

Marginal tergal setae of metathorax and abdomen. In many species of *Actornithophilus* the marginal setae of the tergites are arranged from the lateral margin inwards as follows: the long stout post-spiracular seta followed by a shorter seta; between these two setae, which lie each end of the tergite, is a row of six setae (the tergo-central setae); this arrangement is referred to as Setal Pattern A (Text-fig. 49). In some groups of species tergite VIII has only four central setae and this is referred to as A.1 (Text-figs. 63 and 64). The occasional specimen may have one or two segments in which there is an extra seta. In some species where the central tergal setae are more numerous there may be six stouter and longer, sometimes submarginal, setae which may represent the usual six central setae of pattern A. In certain groups of species (*i.e. ochraceus* and *hoplopteri*) this pattern is quite constant, in other species there may be some specimens which show setal pattern A on certain segments and others in which these segments have a greater number of central setae. In the majority of species from the Charadriidae the metanotum also has setal pattern A, but in *A. grandiceps* there are usually more central setae.

Post-spiracular setae (p.sp.s). See Text-fig. 49.

Preocular enlargement. The enlargement of the lateral margin of the head anterior to the preocular notch.

Preocular nodus. The patch of thickening surrounding the preocular notch (Text-figs. 33-45).

Prosternal setae. The two small setae in the centre of the prosternum which may (Text-fig. 15) or may not (Text-fig. 19) be surrounded by the prosternal plate. There may also be a long central seta posterior to these (Text-fig. 17).

Setal pattern A and A.1. See under marginal setae.

LIST OF SPECIES OF *ACTORNITHOPHILUS* PARASITIC
ON THE CHARADRIIFORMES

Names considered to be synonyms in Hopkins & Clay (1952), are not repeated here.

* Denotes that the holotypes or paratypes have been seen ; † that specimens have been seen from the type host.

Species	Type host	Comments
† <i>affinis</i> (Nitzsch), 1874	<i>Tringa erythropus</i>	= <i>totani</i> (Schränk).
† <i>albus</i> Emerson, 1948	<i>Crocethia alba</i>	= <i>umbrinus</i> (Burmeister) s. l.
* <i>ardeolae</i> Timmermann, 1954	<i>Dromas ardeola</i>	
† <i>bicolor</i> (Piaget), 1880	<i>Arenaria i. interpres</i>	
<i>brachycephalus</i> (Giebel), 1874	<i>Stercorarius pomarinus</i>	Probably straggler ; unidentifiable.
† <i>candidus</i> Carriker, 1949	<i>Gygis alba candida</i>	p. 201.
* <i>ceruleus</i> (Timmermann, 1954)	? <i>Procelsterna c. cerulea</i>	Correct host doubtful (p. 201)
* <i>crassipes</i> (Piaget, 1880)	<i>Thalasseus bergii cristatus</i>	= <i>piceus</i> (Denny).
* <i>crinitus</i> sp. n.	<i>Stephanibyx c. coronatus</i>	p. 205.
† <i>epiphanes</i> (Kellogg & Chapman, 1902)	<i>Anous stolidus pileatus</i>	= <i>incisus</i> (Piaget).
* <i>erinaceus</i> Timmermann, 1954	<i>Rostratula benghalensis</i>	
† <i>flavipes</i> (Giebel, 1874)	<i>Squatarola squatarola</i>	= <i>ochraceus</i> (Nitsch) s. l.
* <i>flumineus</i> sp. n.	<i>Actitis hypoleucos</i>	p. 217.
<i>funnebris</i> (Kellogg, 1896)	<i>Larus glaucescens</i>	= <i>piceus</i> (Denny) s. l.
* <i>fuscipes</i> (Piaget, 1880)	<i>Larus dominicanus</i>	= <i>piceus</i> (Denny) s. l.
* <i>gracilis</i> (Piaget, 1880)	" <i>Platalea alba</i> " Error	True host probably <i>Vanellus vanellus</i> (p. 202).
* <i>grandiceps</i> (Piaget, 1880)	<i>Haematopus ostralegus</i>	p. 226.
† <i>himantopi</i> (Blagoveshtchensky, 1951)	<i>Himantopus h. himantopus</i>	p. 208.
† <i>hirsutus</i> Carriker, 1954	<i>Ereunetes pusillus</i>	= <i>umbrinus</i> (Burm.) s. l.
† <i>hoplopteri</i> (Mjöberg, 1910)	<i>Hoplopterus spinosus</i>	p. 202.
* <i>hrabei</i> Balát, 1953	<i>Erolia a. alpina</i>	= <i>umbrinus</i> (Burm.) s. l.
† <i>incisus</i> (Piaget, 1880)	" <i>Phaeton flavivestris</i> " Error	Host probably <i>Anous stolidus</i> .
* <i>kilauensis</i> (Kellogg & Chapman, 1902)	<i>Heteroscelus incana</i>	p. 224.
* <i>lacustris</i> sp. n.	<i>Catoptrophorus semipalmatus inornatus</i>	p. 220.
<i>lari</i> (Packard, 1870)	<i>Larus marinus</i>	= <i>piceus</i> (Denny) s. l. (p. 201).
† <i>laveni</i> Eichler, 1953	<i>Charadrius h. hiaticula</i>	= <i>ochraceus</i> Nitsch s. l.
* <i>limarius</i> sp. n.	<i>Limnodromus griseus scolopaceus</i>	p. 222.
† <i>limosae</i> (Kellogg, 1908)	<i>Limosa l. lapponica</i>	p. 224.
† <i>lyallpurensis</i> Ansari, 1955	<i>Tringa ochropus</i>	p. 217.
† <i>maurus</i> (Nitzsch, 1866)	<i>Chlidonias n. nigra</i>	= <i>piceus</i> (Denny).
* <i>mexicanus</i> Emerson, 1953	<i>Himantopus h. mexicanus</i>	p. 208.
† <i>milleri</i> (Kellogg & Kuwana, 1902)	<i>Anous stolidus galapagensis</i>	= <i>incisus</i> (Piaget).
† <i>morsitans</i> (Kellogg & Mann, 1912)	<i>Erolia melanotos</i>	= <i>umbrinus</i> (Burm.) s. l.
† <i>multisetosus</i> Blagoveshtchensky, 1940	<i>Lymnocyrtus minima</i>	

Species	Type Host	Comments
† <i>numenii</i> Rudow, 1866	<i>Numenius arquata orientalis</i>	= <i>patellatum</i> (Piaget) (see Clay & Hopkins, 1955 : 53).
<i>ocellatus</i> (Rudow, 1869)	<i>Numenius p. phaeopus</i>	
† <i>ochraceus</i> (Nitzsch, 1818)	<i>Pluvialis apricaria oreophilos</i>	p. 203.
* <i>pacificus</i> (Timmermann, 1955)	<i>Puffinus pacificus</i> Error ?	Probably = <i>incisus</i> Piaget ; host : <i>Anous</i> sp. (p. 202).
<i>paetulus</i> (Kellogg & Kuwana, 1901)	<i>Arenaria i. interpres</i>	p. 233.
* <i>paludosus</i> sp. n.	<i>Tringa nebularia</i>	p. 219.
* <i>patellatus</i> (Piaget, 1890)	<i>Numenius a. arquatus</i>	p. 192.
† <i>pauliani</i> Séguy, 1954	<i>Chionis minor</i>	p. 203.
† <i>pediculoides</i> (Mjöberg, 1910)	<i>Arenaria interpres</i>	p. 191.
* <i>perplanus</i> (Kellogg & Chapman, 1899)	" <i>Lunda cirrhata</i> " Error	= <i>ochraceus</i> (Nitzsch), s. l. (p. 232).
† <i>perrarus</i> Blagoveshtchensky, 1948	<i>Charadrius dubius coronicus</i>	= <i>ochraceus</i> (Nitzsch), s. l.
* <i>piceus</i> (Denny, 1842)	<i>Thalasseus s. sandvicensis</i>	
* <i>pustulatus</i> (Piaget, 1880)	" <i>Gypogeranus (Spizaetus) cirratus</i> " Error	= <i>spinulosum</i> (Piaget).
* <i>pustulosus</i> (Piaget, 1880)	<i>Philomachus pugnax</i>	p. 212.
† <i>raviensis</i> Ansari, 1955	<i>Himantopus himantopus</i>	= <i>himantopi</i> Blagoveshtchensky (p. 236).
* <i>sabulosus</i> sp. n.	<i>Charadrius hiaticula semipalmatus</i>	p. 228.
<i>scopularius</i> (Neumann, 1912)	" <i>Passer domesticus</i> " Error	? = <i>gracile</i> (Piaget) (p. 236).
† <i>sedes</i> Eichler, 1944	<i>Glareola p. pratincta</i>	p. 196.
* <i>spinulosus</i> (Piaget, 1880)	<i>Limosa l. limosa</i>	p. 224.
<i>stictus</i> (Kellogg & Paine, 1911)	<i>Capella delicata</i>	
<i>subpustulatus</i> (Carraker, 1910)	" <i>Ceryle alcyon</i> " Error	p. 235.
* <i>sulcatus</i> (Piaget, 1880)	<i>Chlidonias n. nigra</i>	= <i>piceus</i> (Denny).
<i>svobodai</i> (Balát, 1953) (corrected from <i>svoboda</i> by Balát, 1957)	<i>Vanellus vanellus</i>	= <i>gracile</i> (Piaget).
* <i>tetralicis</i> sp. n.	<i>Burhinus o. oedicephalus</i>	p. 206.
* <i>tigrus</i> (Kellogg & Mann, 1912)	<i>Arenaria melanocephala</i>	= <i>bicolor</i> (Piaget) (p. 236).
* <i>timidus</i> (Kellogg, 1896)	<i>Pluvialis d. dominica</i>	= <i>ochraceus</i> (Nitzsch).
† <i>totani</i> (Schränk, 1803)	<i>Tringa t. totanus</i>	p. 215.
† <i>trilobatus</i> (Giebel, 1874)	<i>Erolia minuta</i>	= <i>umbrinus</i> (Burm.) s. l.
† <i>umbrinus</i> (Burmeister, 1838)	<i>Erolia testacea</i>	p. 212.
* <i>umbrinus</i> (Piaget, 1880)	<i>Erolia testacea</i>	= <i>umbrinus</i> (Burm.) (p. 214).
* <i>umbrosus</i> (Harrison, 1916)	<i>Erolia testacea</i>	= <i>umbrinus</i> (Burm.) (p. 212).
* <i>uniformis</i> (Kellogg, 1896)	<i>Recurvirostra americana</i>	= <i>uniseriatum</i> (Piaget) (p. 210).
* <i>uniseriatus</i> (Piaget, 1880)	<i>Recurvirostra avosetta</i>	p. 208.

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I am indebted to the following for the loan of material : Dr. K. C. Emerson, Dr. F. Balát, Dr. J. Mouchet, the United States National Museum and especially to Dr. P. R. Ehrlich of the Natural History Museum, Stanford University for the loan

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PLATE 4

- FIG. 1. *Actornithophilus crinitus* sp. n. Holotype. (Neg. no. 28330).
- FIG. 2. *Actornithophilus tetracis* sp. n. Holotype. (Neg. no. 28333).
- FIG. 3. *Actornithophilus sabulosus* sp. n. Holotype. (Neg. no. 27445).
- FIG. 4. *Actornithophilus sedes* Eichler. (Neg. no. 28325).
- FIG. 5. *Actornithophilus flumineus* sp. n. Holotype. (Neg. no. 28331).
- FIG. 6. *Actornithophilus kilauensis* (Kellogg & Chapman), ♀ lectotype.





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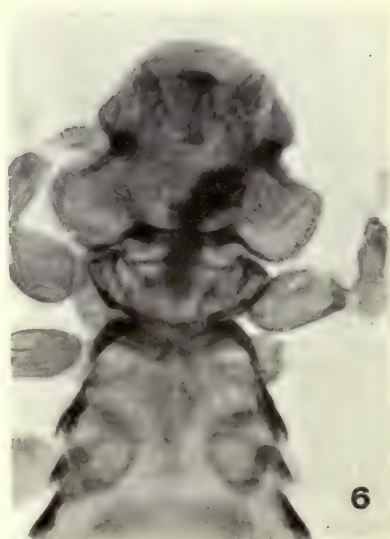
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5



6

PLATE 5

FIG. 1. *Actornithophilus lacustris* sp. n. Holotype. (Neg. no. 28328).

FIG. 2. *Actornithophilus limarius* sp. n. Holotype. (Neg. no. 28326).

FIG. 3. *Actornithophilus paludosus* sp. n. Holotype. (Neg. no. 28327).

FIGS. 4-6. Abdominal tergites of males :

Fig. 4. *A. lacustris*.

FIG. 5. *A. limarius*.

FIG. 6. *A. paludosus*.



PLATE 6

- FIGS. 1-3. Heads of male *Actornithophilus* at same magnification (B. 1, in mm. in brackets).
FIG. 1. *A. uniseriatus* (Piaget) (0.54). (Neg. no. 28340).
FIG. 2. *A. mexicanus* Emerson (0.47). (Neg. no. 28334).
FIG. 3. *A. himantopi* (Blagov) (0.49). (Neg. no. 28335).
FIGS. 4-6. Heads of male *A. umbrinus sens. lat.* from various hosts :
FIG. 4. *Erolia subminuta* (0.39). (Neg. no. 28339).
FIG. 5. *Erolia testacea* (0.46). (Neg. no. 28337).
FIG. 6. *Calidris canutus* (0.54). (Neg. no. 28338).

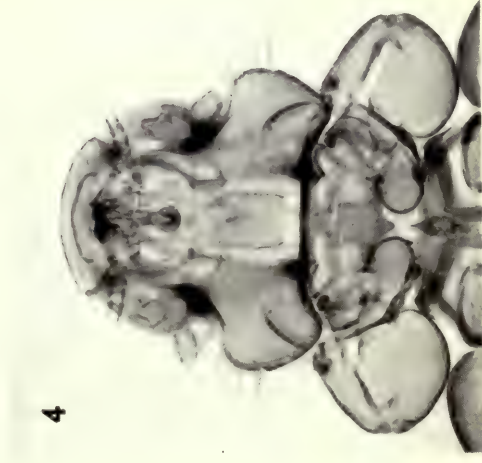
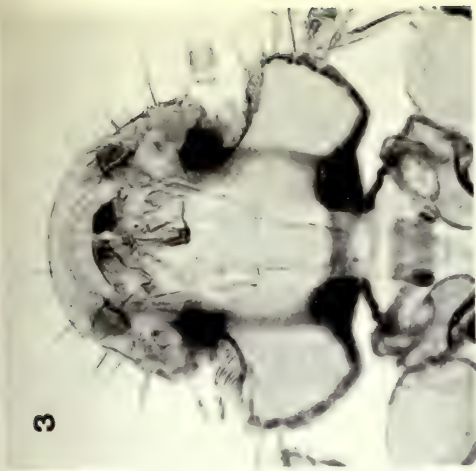


PLATE 7

FIGS. 1-4. Abdominal tergites of male abdomen of *Actornithophilus* spp.:

FIG. 1. *A. hoplopteri* (Mjöberg) from *Hoplopterus spinosus*.

FIG. 2. *A. pauliani* Séguy.

FIG. 3. *A. umbrinus* (Burmeister) from *Erolia testacea*.

FIG. 4. *A. multisetosus* Blagov.

FIG. 5. Male head of *A. ardeolae* Timmermann. (Neg. no. 28336).

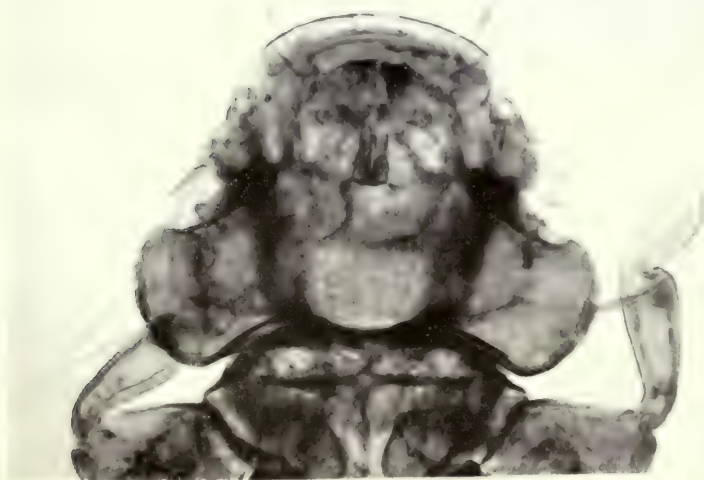
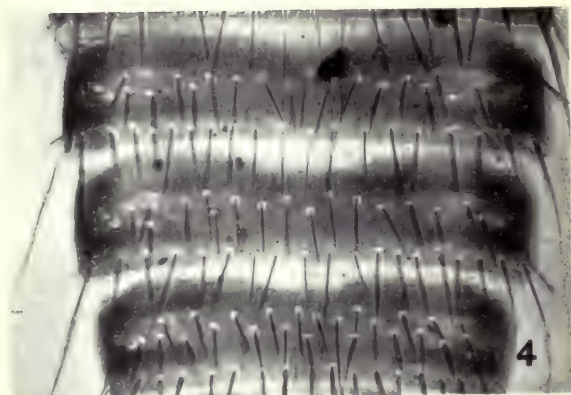
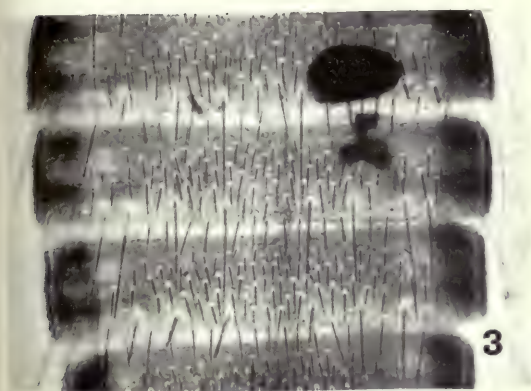
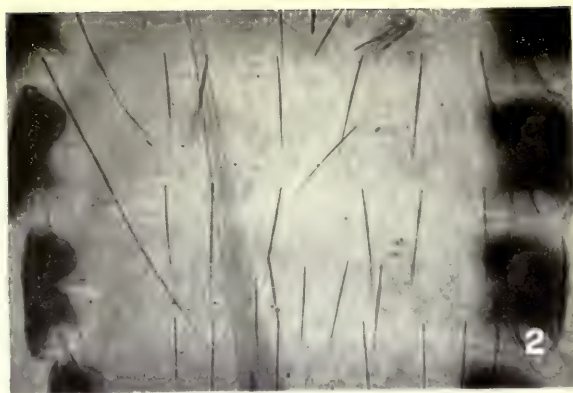
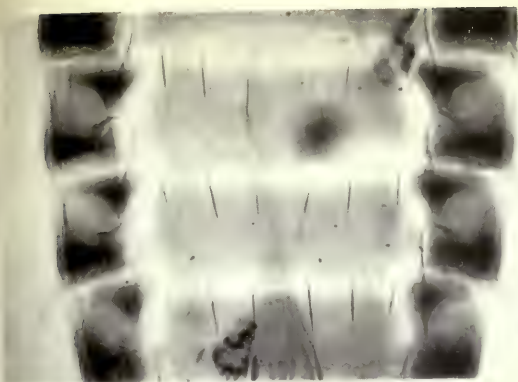


PLATE 8

FIGS. 1-3, Posterior tergites of male abdomen of *Actornithophilus* spp. :

FIG. 1. *A. limosae* (Kellogg) from *Limosa lapponica*.

FIG. 2. *A. limosae* (Kellogg) from *Limosa fedoa*.

FIG. 3. *A. spinulosus* (Piaget).

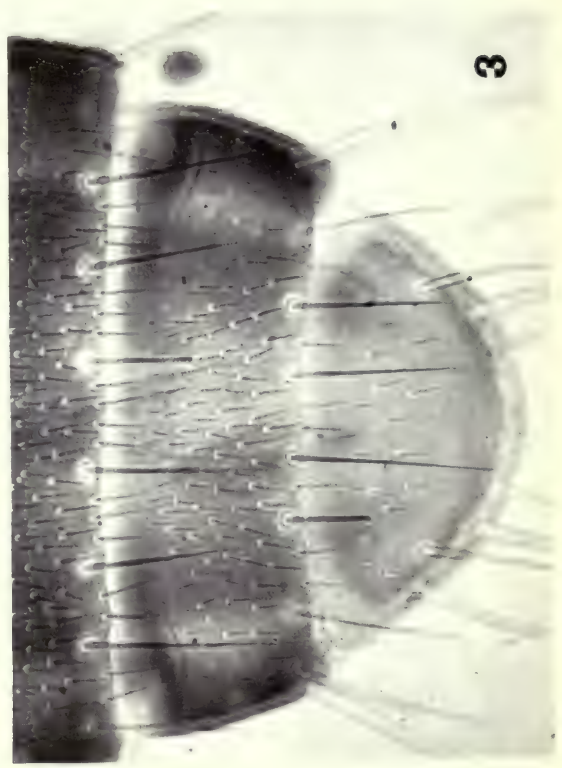


PLATE 9

- FIGS. 1-5. Brush on sternite IV of *Actornithophilus* spp. :
FIG. 1. *A. sabulosus* sp. n.
FIG. 2. *A. ochraceus* from *Pluvialis apricaria*.
FIG. 3. *A. pauliani* Séguy.
FIG. 4. *A. hoplopteri* (Mjöberg) from *Hoplopterus spinosus*.
FIG. 5. *A. tetralicis* sp. n.
FIG. 6. Abdominal tergites of male *A. bicolor* (Piaget).

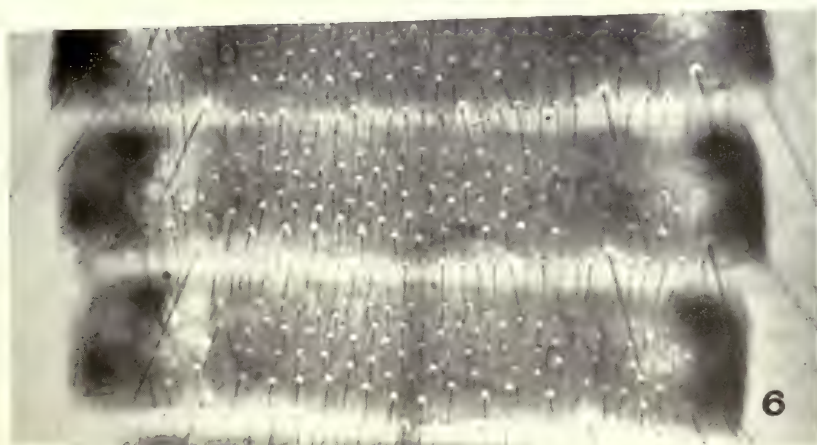


PLATE 10

FIGS. 1-6. Male genital sclerite of *Actornithophilus* spp. :

- FIG. 1. *A. umbrinus* (Burmeister) from *Erolia testacea*. Phase contrast.
- FIG. 2. *A. pustulosus* (Piaget). Phase contrast.
- FIG. 3. *A. ochraceus* from, *Pluvialis apricaria*. (Neg. no. 28322).
- FIG. 4. *A. crinitus* sp. n. Phase contrast.
- FIG. 5. *A. hoplopteri* (Mjöberg) from *Hoplopterus spinosus*. Phase contrast.
- FIG. 6. *A. tetralicis* sp. n. Phase contrast.

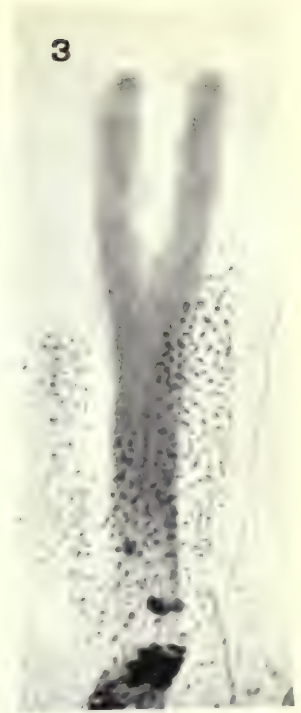
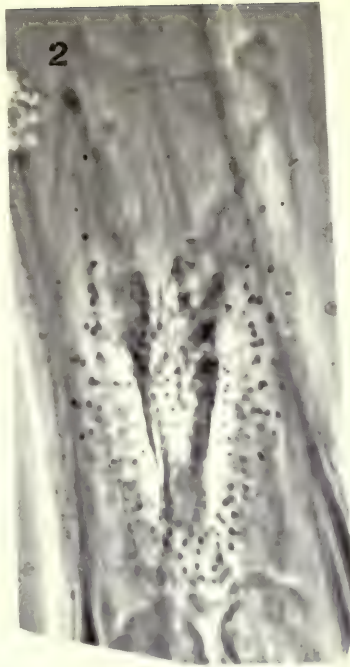


PLATE II

FIGS. 1-5. Male genital sclerite of *Actornithophilus* spp.

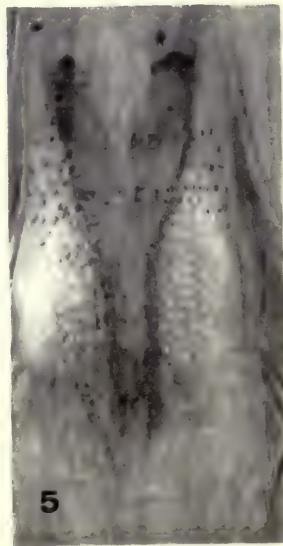
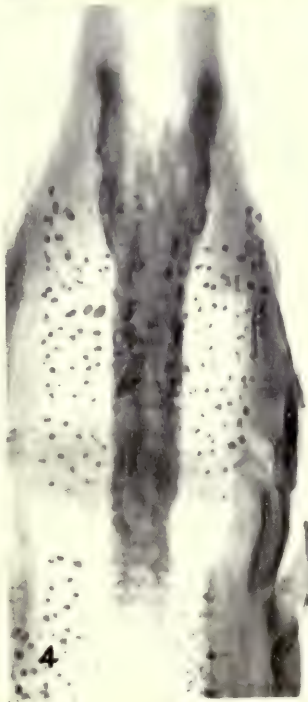
FIG. 1. *A. totani* (Schrank). (Neg. no. 28323).

FIG. 2. *A. sedes* Eichler. Phase contrast.

FIG. 3. *A. bicolor* (Piaget). (Neg. no. 28324).

FIG. 4. *A. limarius* sp. n. (Neg. no. 28320).

FIG. 5. *A. lacustris* sp. n. (Neg. no. 28321).



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THOMAS R. ODHIAMBO

BULLETIN OF
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Vol. 11 No. 6

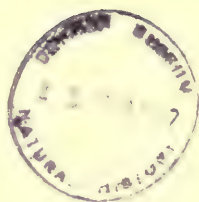
LONDON: 1962

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BY

THOMAS R. ODHIAMBO

Queens' College, Cambridge



Pp. 245-331 ; 215 Text-figures

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REVIEW OF SOME GENERA OF THE SUBFAMILY BRYOCORINAE (HEMIPTERA : MIRIDAE)

By THOMAS R. ODHIAMBO

SEVERAL lengthy accounts of the Bryocorinae have been given, of which perhaps mention should be made of those by Distant (1880-93, 1904, 1910), Knight (1923), and Poppius (1912, 1912a, 1915). Modern work really begins, however, with the revision of the Bryocorinae provided by China (1944). This outstanding work, although it was limited to the Bryocorinae of the Ethiopian Region, forms a basis from which revisions of single genera can profitably be reviewed—for instance, the many publications of Carvalho for the Neotropical Region particularly, and Schouteden for the Ethiopian Region only.

The great interest in the Bryocorinae is inspired not only because of the peculiar outgrowths and modifications of the external cuticular structure, found nowhere else in the Miridae to such an extent, but also on account of the inclusion of many species as serious pests of tea, cacao, coffee, cotton, and a number of other economic crops.

This work grew out of studies carried out in the British Museum (Natural History) during the summer of 1960, as a first step in a programme to revise the Miridae of the Ethiopian Region, which the author intends to pursue during the next few years. This is being done as a prelude to the investigation of the higher classification of the Miridae, and to the ecological studies of the family.

One of the problems which has been encountered in the present study is the extreme difficulty in using the structure of the male genitalia either for generic or for specific identification. In contrast to the situation in the tribe Halodapini (Odhiambo, 1959a), or in such genera as *Probosciodocoris* (Odhiambo, 1959) and *Cyrtopeltis* (Odhiambo, 1961) where the male genitalia can easily be used to characterize genera or species, the male genitalia in the Bryocorinae lack any obvious or easily appreciated differential characteristics. Hence, the heavy reliance on such characters as external cuticular structures, puncturation, and pubescence.

The material used for this study consisted of specimens in the British Museum, a few type-specimens sent on loan for study from European museums, material collected in West Africa and kindly sent to me by Dr. J. Carayon of the Paris Natural History Museum, a small collection from the Coryndon Memorial Museum in Kenya, and specimens collected by the Entomological Staff of the Kawanda Research Station in Uganda.

I should like to express my gratitude to the Trustees of the British Museum for granting me a vacation studentship for eight weeks to work in the Museum, to Dr. W. E. China who gave me invaluable advice and encouragement during my study, to Mr. R. J. Izzard who offered me laboratory facilities and arranged for types from European museums to be sent to me for study, and to Dr. M. S. K. Ghauri with whom I freely discussed many problems. Some preliminary work was done in October, 1958, while I was re-arranging the Mirid collection in the Coryndon Museum; I should like to thank Mr. R. H. Carcasson, curator of insects, for the pleasant time I had while working in his department.

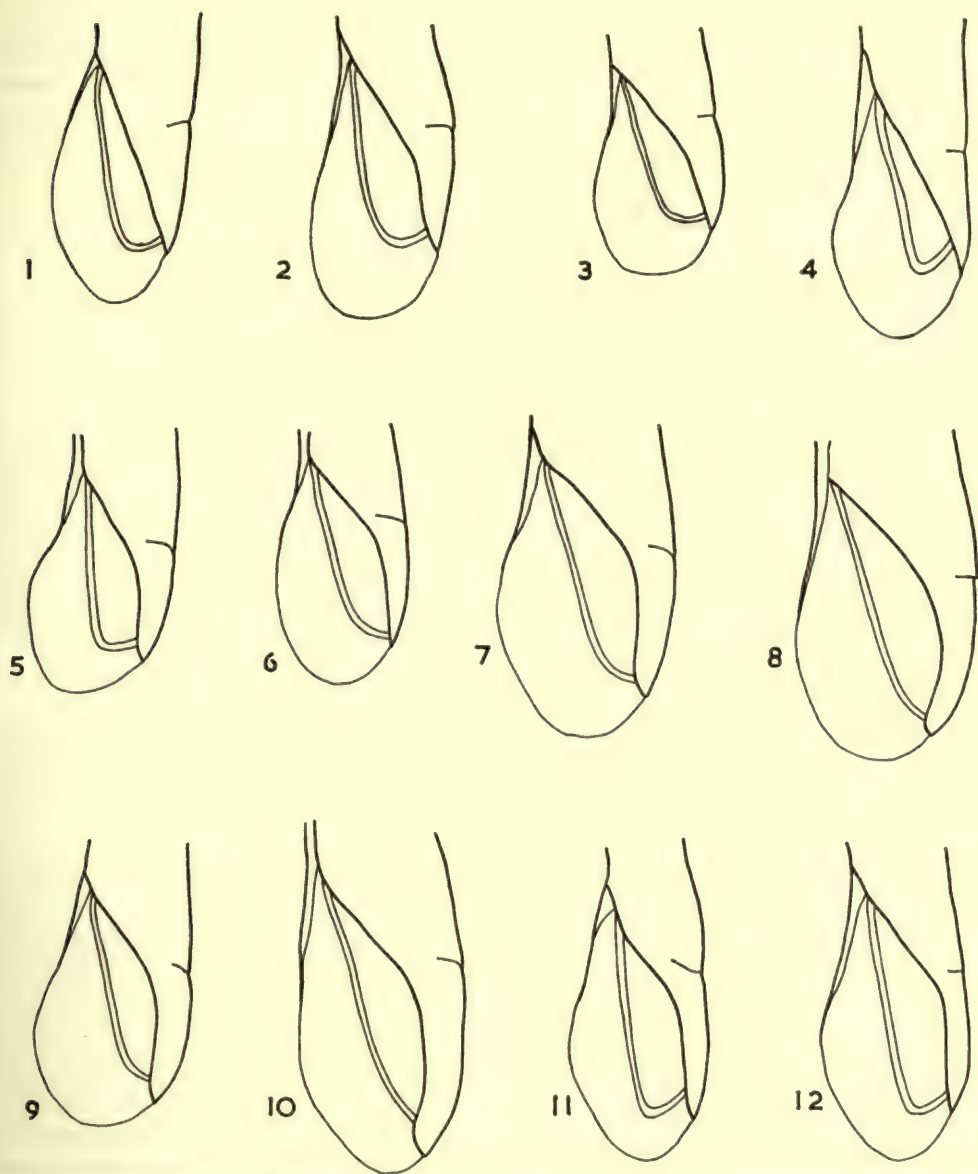
Tribe BRYOCORINI

Genera *PRODROMUS* and *SINERVUS*

In 1904 Distant described from Ceylon and Burma three new species (*subflavus*, *clypeatus*, *subviridis*) contained in *Prodromus*, a new genus he erected to receive them (Distant, 1904a : 436-437). In 1909 he described a fourth species, *P. cuneatus*, from Burma, which he re-described in 1910 (Distant, 1910). Poppius (1911) considered this last species to be so different from the other three as to warrant a distinct new genus—*Prodromopsis*. He further described four new species in *Prodromopsis* from the Pacific region (Poppius, 1912a, 1913, 1914a, 1915). But Carvalho (1948 : 191), in two brief paragraphs, decided that *Prodromopsis* Poppius, 1911, and *Sinervus* Stål, 1860, were synonymous, indicating that the male genitalia were similar (although no illustrations were given) ; and he therefore sank the genus *Prodromopsis*.

Poppius enumerated the following differences to distinguish *Prodromopsis* from *Prodromus* : (1) a vertical head, (2) a more swollen anteclypeus, (3) longer genae, (4) the structure of the antennae (the last segment of which is very long and thin), (5) the longer and narrower cuneus, as well as (6) shorter hairs on the body and legs. However, recent study by the author has revealed that the above characters are not valid at all, except perhaps the nature of the cuneus. Gradations are found in all these characters in both *Prodromus* and *Prodromopsis* ; and, even in the case of the cuneus, *cuneatus* has a long and narrow cuneus (Text-fig. 8), *subflavus* has a more or less triangular and broad cuneus (Text-fig. 2), and *subviridis* and *clypeatus* are intermediate between the two extremes (Text-figs. 6 and 7).

Consequently, the present writer has decided to transfer *cuneatus* back to *Prodromus* **sp. rev.** One other species at least, *philippinensis*, placed by Poppius in *Prodromopsis*, appears to belong to *Prodromus* ; but this and the other three species of Poppius will be left in *Sinervus* (= *Prodromopsis*) until the types have been examined. The only species which definitely belong to *Sinervus* are : *barensprungi* Stål, *costalimai* Carvalho, *discopiceus* Carvalho, and *hyalipedes* Carvalho—all Neotropical in distribution. The paratypes and male genitalia of *costalimai* and *hyalipedes* have been examined in the present study (Text-figs. 12a-18) ; and illustrations of external structure and male genitalia (including the original descriptions) of all four species undoubtedly show that the four species form a good and distinct genus.



FIGS. 1-12. Cuneus and curvature of membranal vein. 1, *Prodromus hawandanus* sp. n.; 2, *P. subflavus* Distant; 3, *P. thaliae* China; 4, *P. melanonotus* Carvalho; 5, *P. flavonotus* sp. n.; 6, *P. subviridis* Distant; 7, *P. clypeatus* Distant; 8, *P. cuneatus* Distant; 9, *P. cochinensis* sp. n.; 10, *P. pedunculus* sp. n.; 11, *Sinervus costalimai* Carvalho; 12, *S. hyalipedes* Carvalho.

Apart from the structure of the male genitalia, *Prodromus* and *Sinervus* may be separated as follows :

Prodromus

1. Head : transverse, less than twice as wide as long ; as wide as posterior margin of anterior lobe of pronotum, or a little wider
2. Frons : swollen (in a blunt way)
3. Antennal sclerites : minute ; about one-quarter or so as long as antennal segment I is thick
4. Pronotum : not forming a distinct " neck " or " waist ", without a transverse row of punctures between anterior and posterior lobes
Calli separated from each other medially by a depression
Anterior margin of anterior lobe much narrower than posterior margin of the same
5. Pronotal collar : anterior margin curved (i.e. concave)
6. Anterior acetabula : invisible from above
7. Hemelytra : with dense sub-erect hairs ; densely minutely punctured, somewhat shiny and translucent or opaque

Sinervus

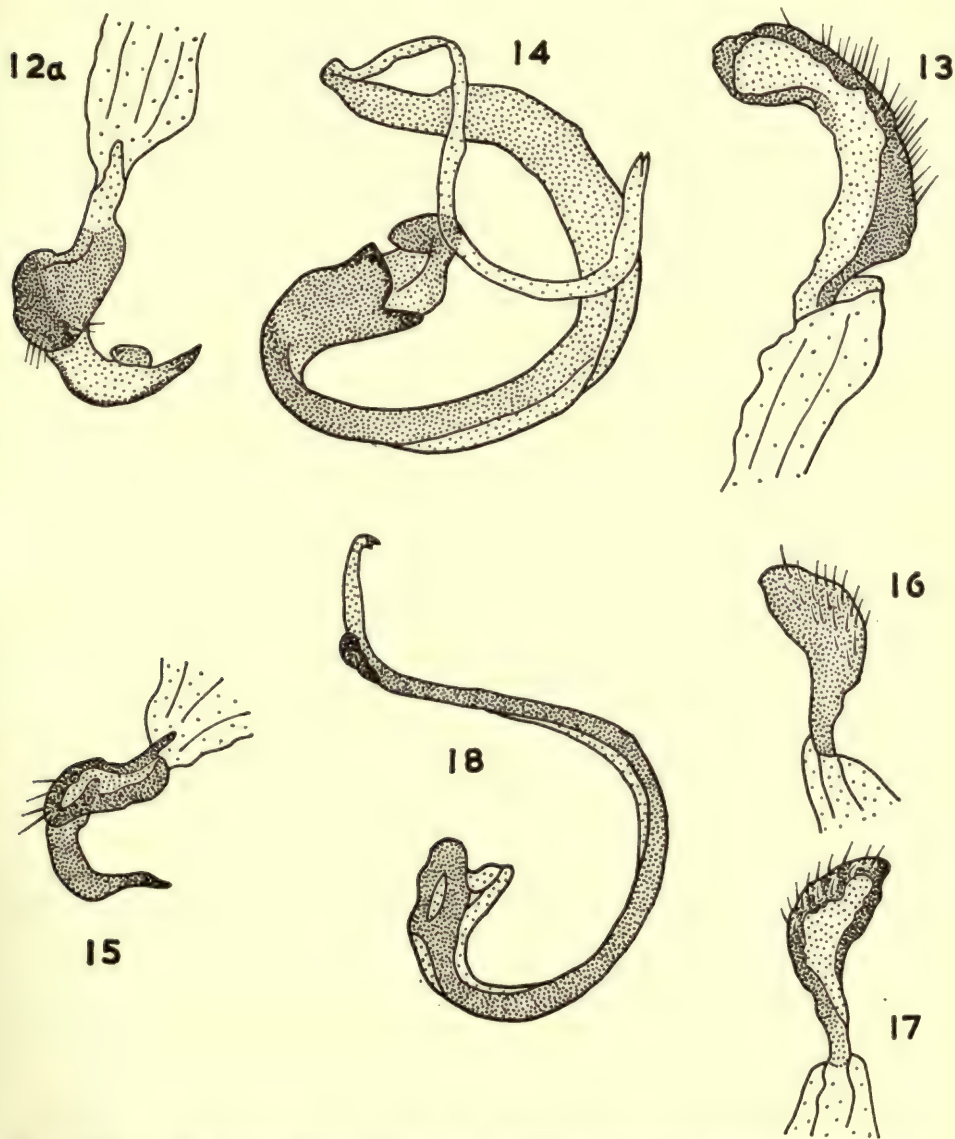
- Very wide, $2\frac{1}{2}$ times as wide as long ; nearly twice as wide as posterior margin of anterior lobe of pronotum, and about as wide as middle of posterior lobe of pronotum.
- Concave in front (as seen from above).
- Prominent ; as long as antennal segment I is thick.
- Anterior lobe very narrow, separated from posterior lobe by a transverse row of punctures.
- Calli confluent.
- Anterior margin of anterior lobe only slightly narrower than posterior margin.
- Straight.
- Very distinct.
- Sub-glabrous, with very sparse hairs ; smooth (i.e. unpunctured), very shiny and transparent.

PRODROMUS Distant

- 1904a. *Prodromus* Distant, *Faun. Brit. Ind., Rhynchota*, 2 : 436.
1912. *Prodromus* Distant ; Poppius, *Acta Soc. Sci. fenn.* 41 (3) : 196.

RE-DESCRIPTION. General shape elongate, more or less distinctly widened at the sides ; body shortly hairy, the hairs being shiny white. Head smooth, shiny, with erect or sub-erect hairs ; vertical, transverse, about $1\frac{1}{2}$ times as wide as long, and at least as wide as posterior margin of anterior pronotal lobe ; posteriorly narrowed to a short neck. Vertex depressed, medially with a very fine longitudinal sulcus. Frons bluntly swollen from above. Anteclypeus more or less strongly inflated ; separated from frons by a transverse impression. Eyes sub-stylate, strongly prominent, from above kidney-shaped, from the side with lower margin curved or sinuate ; occupying only one-third of height of head. Rostrum usually extending beyond fore coxae. Antennae thin, very densely hairy ; segment I with at least basal one-quarter narrowed, segments III and IV very thin, segment IV the longest, segments II to IV linear. Pronotum coarsely and very densely (almost reticulately) punctate, punctures on calli and collar sometimes less distinct ; posterior margin broadly emarginate, anterior margin concavely curved away from head ; posterior lobe convex and tumid, anterior lobe flattened. Calli distinct, large, reaching lateral margin of pronotum, feebly elevated, separated from each other by a median depression.

Collar thick, much thicker than antennal segment I; feebly swollen. Scutellum more or less equilateral, flattened, smooth, shiny, with some sub-erect hairs. Hemelytra translucent or opaque, more or less distinctly widened laterally, densely regularly covered with sub-erect hairs and irregularly so with fine punctures; embolium equally wide throughout, delimited by a row of almost confluent punctures;



FIGS. 12a-18. Male genitalia; 12a-14 of *Sinervus costalimai* Carvalho, 15-18 of *S. hyalipedes* Carvalho. 12a and 15, left paramere; 13, 16 and 17, right paramere; 14 and 18, aedeagus.

cuneus long, sub-triangular, or narrow and with the inner margin curved ; membranaral vein with minute hairs, vein terminating very near apex of cuneus. Legs moderately long, very densely shortly hairy, hairs along posterior aspect of femora long. Type-species : *Prodromus subflavus* Distant.

This genus is distributed through the Ethiopian Region (West and East Africa, and the Congo), Ceylon, and Lower Burma. Material in the British Museum (Nat. Hist.), and that collected by the author in Uganda, has revealed four new species, and extended the distribution to include Malaya and Dutch New Guinea.

The key provided below for the separation of *Prodromus* species does not include *P. alboviridescens* (Motschulsky), 1863, whose identity is in considerable doubt. Bergroth (1917, *Rev. Russe d'Ent.* 17 : 108) transferred this species from *Leptomerocoris* to *Prodromus*, and also noted that the type was lost. Distant (1904 : 487) reproduced the original description without comment, except that he was unable to recognize the species. From such passages as "tibiae nude" and "pronotum . . . anteriorly glabrous" it appears that the description was based on a damaged specimen. At any rate the description is quite unsatisfactory for the recognition of the nominal species.

KEY TO SPECIES OF *Prodromus*

1. Eyes pedunculate, eye peduncle nearly as long as an eye is wide ; antennal segment I about twice as long as median length of head, basal half slender ; pronotum across humeral angles three times as wide as across pronotal collar ; apex of cuneus falling short of apex of membrane by only one-fifth length of head. Rostrum extends to precoxae. (Dutch New Guinea) ***P. pedunculus*** sp. n.
- Eyes at most sub-stylate, eye peduncle at most two-thirds as long as an eye is wide ; antennal segment I at most $1\frac{1}{2}$ times as long as median length of head, less than basal half slender ; pronotum across humeral angles less than three times as wide as across pronotal collar ; apex of cuneus falling short of that of membrane by at least one-third length of head 2
2. Pronotum and/or scutellum largely brown or fuscous ; venter at least with fuscous markings, if pale entirely then antennal segment I longer than head 3
- Dorsum pale in colour ; venter pale, at most with apex of abdomen fuscous 6
3. Venter pale, stramineous ; on dorsum only scutellum dark, fuscous ; antennal segment II pale, with apical one-quarter reddish ; antennal segment III three times as long as segment I. Cuneus with inner margin curved. Rostrum reaching middle of mesocoxae. (Lower Burma, Malaya) ***P. clypeatus*** Distant
- Venter with fuscous markings on thorax at least ; pronotum, scutellum, and hemelytra with extensive dark markings ; antennal segment II fuscous ; antennal segment III at most $2\frac{1}{2}$ times as long as segment I 4
4. Head orange, anteclypeus darker ; antennal segment I pale in colour. (Senegal) ***P. nimbus*** Delattre
- Head brown or black, anteclypeus sometimes flavescent ; antennal segment I with with extensive brownish markings. Rostrum extends to apices of fore coxae 5
5. Antennae inserted near middle of eyes ; antennal segment I about $1\frac{1}{2}$ times as long as head, basal two-fifths slender ; antennal segments II and III equal in length ; inner margin of cuneus straight, membranaral vein forming a right angle at apex ; inner margin of cuneus broadly fuscous and membranaral vein fuscous. (Ghana, Cameroons, Congo) ***P. melanonotus*** Carvalho

- Antennae inserted at lower margin of eyes ; antennal segment I $1\frac{1}{2}$ times as long as head, only basal one-third slender ; antennal segment III distinctly longer than segment II ; inner margin of cuneus a little curved, membranar vein broadly rounded ; cuneus and membranar vein pale throughout. (Ghana) *P. flavonotus* sp. n.
6. Antennae fuscous, segment I pale at base and sometimes tinted with orange at apex, segment II sometimes pale brown at base ; rostrum not reaching mesocoxae 7
- Antennae with reddish markings, at least on segments II and III, segments I and II largely in colour ; rostrum reaches bases of mesocoxae, or, if not, then antennal segments I and II red 8
7. Antennal segment II slightly less than $1\frac{1}{2}$ times as long as segment I ; antennal segment I suffused with red at apex ; head brown. (Senegal) . *P. joveri* Delattre
- Antennal segment II slightly more than twice as long as segment I ; antennal segment I infuscate apically ; head greenish-white. Hemelytra almost linear at the sides. (Ghana) *P. thaliae* China
8. Antennal segment II about as long as pronotum ; segment III much shorter than segment II. (Kenya) *P. aethiopicus* Poppius
- Antennal segment II much longer than pronotum ; segment III at least about as long as segment II 9
9. Cuneus triangular in shape, only twice as long as broad, inner margin linear, apex falls short of membranar apex by a distance equal to length of head ; membranar cell broadly rounded at apex or almost rectangular. Antennal segment I about as long as head 10
- Cuneus long and narrow, at least three times as long as broad, inner margin curved, apex falls short of membranar apex by a distance equal to at most two-thirds length of head ; membranar vein slightly curved at apex 11
10. Lower margin of antennal sclerites below lower margin of eyes, the former narrowly separated from eyes ; antennal segment I and II reddish, base of segment I pale in colour ; dorsum bright green, claval commissures brownish. (Uganda) *P. kawandanus* sp. n.
- Lower margin of antennal sclerites above lower margin of eyes, antennae separated from eyes by a distance equal to thickness of basal portion of segment I ; antennal segment I stramineous, segment III with base and apex red ; dorsum ochraceous, corium and cuneus stramineous. (Ceylon) *P. subflavus* Distant
11. Antennal segment II twice as long as segment I, the latter longer than head ; segment II with only apical one-quarter reddish 12
- Antennal segment II distinctly more than twice as long as segment I, the latter about as long as head ; segment II with base and apex broadly reddish-brown. (Ceylon) *P. cuneatus* Distant
12. Antennal segment III much longer than segment II ; head and thorax dorsally largely ochraceous ; pronotum $1\frac{1}{2}$ times as broad as long. (Cochin China) *P. cochinenensis* sp. n.
- Antennal segment III about as long as segment II ; head and thorax dorsally stramineous ; pronotum $1\frac{1}{2}$ times (or less) as broad as long. (Lower Burma) *P. subviridis* Distant

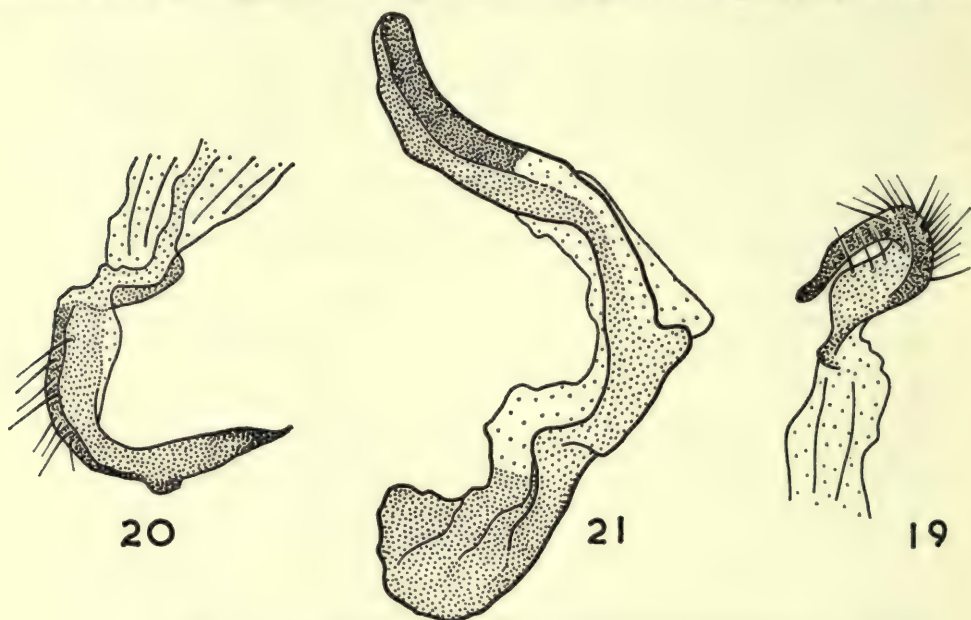
Prodromus subflavus Distant

(Text-figs. 2, 19–21)

1904a. *Prodromus subflavus* Distant, *Faun. Brit. Ind., Rhynchota*, 2: 437, 2 figs.

MALE. *Structure*. Head transverse, with eyes nearly twice as wide as long in the middle (38 : 22) ; vertex twice as wide as an eye (21 : 10) ; as seen from in front,

eyes projecting from vertex by nearly half length of eye; eye peduncle¹ about half as long as width of eye (6 : 10). Rostrum extending to bases of mesocoxae. Antennae inserted towards lower margin of eyes, and separated from inner margin of the latter by a distance equal to basal thickness of antennal segment I; relative lengths of segments, 25 : 53 : 54 : 95; segment I thickened, basal one-third slender. Pronotum across humeral angles $1\frac{3}{4}$ times as wide as it is long in the middle (74 : 43), and about $2\frac{2}{3}$ times as wide as anterior collar (74 : 28). Cuneus triangular, about twice as long as basal width (40 : 19); inner margin almost straight (Text-fig. 2); apex falls short



FIGS. 19-21. Male genitalia of *Prodrormus subflavus* Distant.
19, left paramere; 20, right paramere; 21, aedeagus.

of membranal apex by a length equal to length of head. Membranal vein broadly rounded at apex (Text-fig. 2). Genitalia illustrated in Text-figs. 19-21. Length of body 5.2 mm., width across humeral angles 1.33 mm.

Colour. Head, pronotum, scutellum, clavus, and venter ochraceous. Antennae, corium, cuneus, and legs stramineous; a band at base and apex of antennal segment II, another at apex of segment III, a broad band near middle and another near apex of segment IV, red; membrane pale hyaline; apices of tarsi brownish. Pubescence shiny white.

FEMALE. Unknown.

MATERIAL EXAMINED. CEYLON: Peradeniya, 1 ♂, xii.1901. Holotype, in the British Museum (Natural History)².

The colour of the antennae as described here differs from that given in the original description.

¹ As measured from vertex to dorsal middle of internal margin of eye.

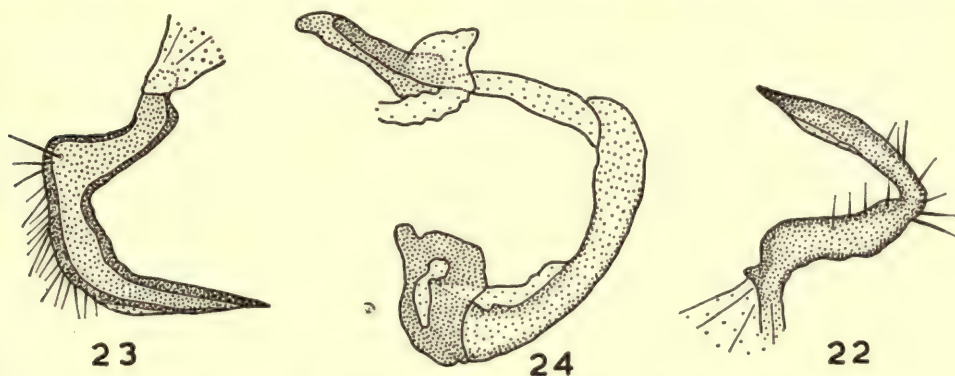
² Henceforth referred to by the initials "B.M."

Prodromus cuneatus Distant

(Text-figs. 8, 22-24)

1909. *Prodromus cuneatus* Distant, *Ann. Mag. nat. Hist.* **4** : 453.
 1910. *Prodromus cuneatus* Distant; Distant, *Faun. Brit. Ind., Rhynchota*, **5** : 246, 1 fig. (re-description).
 1911. *Prodromopsis cuneatus* (Distant) Poppius, *Öfvers. finska VetenskSoc. Förh.* **53A** (2) : 4 (type of *Prodromopsis*).
 1948. *Sinervus cuneatus* (Distant) Carvalho, *Rev. bras. Biol.* **8** (2) : 191.

MALE. Structure. Head transverse, together with eyes twice as wide as long in the middle (50 : 24) ; vertex more than twice as wide as an eye (31 : 13) ; as seen from in front, eyes projecting from vertex by one-quarter length of eye ; eye peduncle about half as long as width of eye (6 : 13). Rostrum extending to bases of mesocoxae.



FIGS. 22-24. Male genitalia of *Prodromus cuneatus* Distant.
 22, left paramere ; 23, right paramere ; 24, aedeagus.

Antennae inserted towards lower margin of eyes, and narrowly separated from inner margin of the latter by a distance less than basal thickness of antennal segment I ; relative lengths of segments, 25 : 65 : 87 : 91 ; basal one-third of segment I slender. Pronotum across humeral angles slightly more than $1\frac{1}{2}$ times as wide as long in the middle (68 : 44), and about $2\frac{1}{2}$ times as wide as across pronotal collar (68 : 28). Cuneus long and narrow, about four times as long as wide at base (63 : 15) ; inner margin curved and somewhat parallel to outer margin (Text-fig. 8) ; apex falls short of membranous apex by a length equal to about one-third length of head. Membranous vein linear, then slightly curved towards apex (Text-fig. 8). Genitalia illustrated in Text-figs. 22-24 ; width across pronotal humeral angles 1.22 mm.

Colour. Head, pronotum, scutellum, and venter pale ochraceous. Antennal segments I and II pale ochraceous, basal one-third to nearly half of segment II and apical one-quarter of the same reddish-brown, extreme base pale ; segments III and IV brownish, with obscure reddish tinge. Hemelytra and legs stramineous, membrane pale hyaline, apices of tibiae pale ochraceous, apices of tarsi fuscous. Pubescence shiny white.

FEMALE. Unknown.

MATERIAL EXAMINED. CEYLON: Peradeniya, 1 specimen with abdomen missing, v. 1909 (Holotype). 1 ♂, same data. Both in B.M.

The structure of the antennae differs somewhat from that given in the original description. But this species can easily be distinguished by its elongated cuneus (approaching the condition found in *Sinervus* and a number of other Bryocorine genera), the almost wholly linear membranal vein, the broad pronotum, the relatively long antennal segment III, and by the colour of the antennae.

Prodromus clypeatus Distant

(Text-figs. 7, 25–28)

1904a. *Prodromus clypeatus* Distant, *Faun. Brit. Ind., Rhynchota*, 2: 437.

The male is described for the first time.

FEMALE. *Structure*. Head strongly transverse, together with eyes more than twice as wide as long in the middle (51:22), very densely covered with erect hairs; vertex more than twice as wide as an eye (31:13); as seen from in front, eyes projecting from vertex by slightly less than one-third length of eye; eye peduncle more than half as long as width of eye (9:13). Rostrum reaches middle of mesocoxae. Antennae inserted very near lower margin of eyes, and separated from inner margin of the latter by a distance equal to half thickness of basal portion of segment I; relative lengths of segments, 30:67:90:120; basal one-third of segment I slender. Pronotum across humeral angles more than $1\frac{1}{2}$ times as wide as long in the middle (77:47), and $2\frac{1}{2}$ times as wide as across pronotal collar (77:30). Cuneus long and narrow, a little less than four times as long as wide at base (56:15); inner margin curved, somewhat as in *P. cuneatus* (Text-fig. 7); apex of cuneus falls short of membranal apex by a distance about equal to two-thirds length of head. Membranal vein linear, gently curved towards apex (Text-fig. 7). Length of body 5.5 mm., width across humeral angles 1.54 mm.

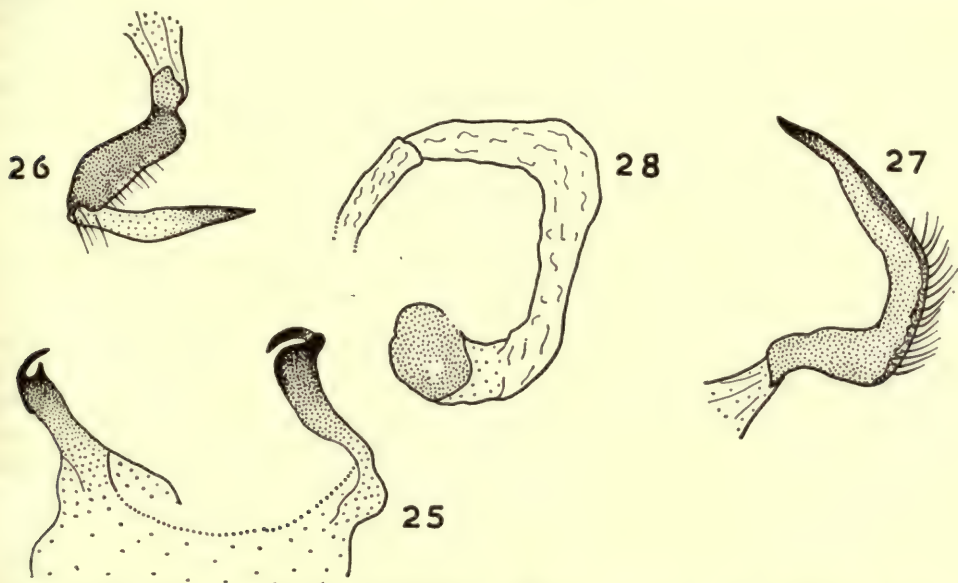
Colour. General colour stramineous. Head and inner margin of clavus ochraceous. Antennal segment I pale ochraceous, basal slender portion stramineous; segment II very pale ochraceous, apical one-quarter (or more) reddish; segments III and IV smoky brown with reddish suffusion, segment III broadly pale at base. Scutellum fuscous; base narrowly, and mesoscutum entirely, pale ochraceous. Membrane pale hyaline, vein pale ochraceous. Pubescence shiny white.

MALE. *Structure*. Head a little more than twice as wide as long (45:20); vertex twice as wide as an eye (27:12); eye peduncle two-thirds as long as an eye is wide (8:12). Lower margin of antennal sclerites almost on the same level as lower margin of eyes; relative lengths of antennal segments, 25:62:88:90. Pronotum across humeral angles $1\frac{3}{4}$ times as wide as long in the middle (73:40), and $2\frac{1}{2}$ times as wide as across pronotal collar (73:28). Cuneus three times as long as wide (58:18); apex falls short of membranal apex by half length of head. Genitalia illustrated in Text-figs. 25–28. Length of body 5.3 mm., width across humeral angles 1.3 mm. Otherwise, structure as in the female.

Colour. As in the female, except much paler.

MATERIAL EXAMINED. LOWER BURMA : Tenasserim Valley, Myitta, 2 ♀ (including Holotype) (Doherty). MALAYA : Jelebu, 5 ♂, 5 ♀ on *Musa sapientum* (young leaves), 9.xii.1934. All in B.M.

The corium is quite distinctly and densely pubescent, as in other species of the genus although in the original description Distant said, "... corium finely and obscurely pilose."



FIGS 25-28. Male genitalia of *Prodromus clypeatus* Distant. 25, pygophore from above : hook-like structures holding and guiding right paramere ; 26, left paramere ; 27, right paramere ; 28, aedeagus.

The most remarkable feature of this species is the development of two hook-like structures on the dorsal aspect of the last abdominal segment which are presumably used to hold and guide the right paramere into position (Text-fig. 25). In other respects, *P. clypeatus* is very similar to *P. cuneatus*, from which it may be separated by the dense hairiness of the head, the extremely long antennal segment IV, the colour of the antennae, the relative lengths of cuneus and membrane, and the dark scutellum.

Prodromus subviridis Distant

(Text-figs. 6, 29-31)

1904a. *Prodromus subviridis* Distant, *Faun. Brit. Ind., Rhynchota*, 2 : 437.

MALE. Structure. Head transverse, together with eyes twice as wide as long in the middle (37 : 18), very densely covered with relatively long erect hairs ; vertex about twice as wide as an eye (22 : 10) ; as seen from in front, eyes projecting from

vertex by one-quarter length of eye; eye peduncle about half as long as width of an eye (6:10). Antennae inserted towards lower margin of eyes, and separated from inner margin of eyes by a distance equal to about half thickness of basal portion of segment I; relative lengths of segments, 24:46:48:90; basal one-quarter of segment I slender. Pronotum across humeral angles $1\frac{1}{2}$ times as wide as long in the middle (48:36), and about twice as broad as across pronotal collar (48:23), densely covered with relatively long erect hairs. Cuneus elongated, three times as long as wide at base (49:16); inner margin curved (Text-fig. 6); apex of cuneus falls short of membranous apex by two-thirds length of head. Membranous vein linear, but gently curved towards apex (Text-fig. 6). Genitalia illustrated in Text-figs. 29–31. Length of body 3.9 mm., width across humeral angles 0.86 mm.



FIGS. 29–31. Male genitalia of *Prodrromus subviridis* Distant.
29, left paramere; 30, right paramere; 31, aedeagus.

Colour. General colour stramineous, with obscure greenish tinge (in original description: "very pale greyish-green"). Apical one-quarter of antennal segment II reddish; segments III and IV brownish, with reddish tinge. Membrane pale hyaline; vein stramineous, with greenish tinge. Abdominal venter sometimes pale ochraceous. Apices of tarsi brownish. Pubescence shiny white.

FEMALE. Structure. Relative dimensions of width of pronotum across humeral angles, median length of pronotum, and width across anterior collar, 48:41:22. Length of body 4.1 mm., width across humeral angles 0.88 mm. Otherwise, structure as in the male.

Colour. Similar to male.

MATERIAL EXAMINED. LOWER BURMA: Tenasserim, Myitta, 1 ♂ (Holotype), 1 ♂, 1 ♀ (Doherty). All in B.M.

The cuneus is similar in structure in *P. subviridis*, *P. cuneatus*, and *P. clypeatus*, although it is distinctly shorter in *P. subviridis*. The latter species may also be distinguished by its relatively short antennal segment III—which recalls the condition found in *P. subflavus*. The male genitalia of *P. subviridis* is, however, similar to that of *P. cuneatus*; and the eyes project from the vertex as shortly as in this species.

Other salient features of *P. subviridis* are: the somewhat narrow vertex; the relatively long, erect, and very dense pubescence on the head and pronotum; and the elongated pronotum.

***Prodromus melanonotus* Carvalho**

(Text-fig. 4)

1951. *Prodromus melanonotus* Carvalho, *Rev. Zool. Bot. afr.* **45** (1-2): 109, figs.

MALE. Structure. Head transverse, together with eyes nearly twice as wide as long in the middle (42 : 22); vertex twice as wide as an eye (25 : 12); frons swollen greatly; as seen from in front, eyes projecting from vertex by one-quarter length of eye, as seen from above, eyes appearing hardly with a notch in the middle, produced posteriorly to about level of anterior margin of pronotum; eye peduncle about half as long as eye width (5 : 12); eyes large, from the side appearing to occupy about half height of head. Rostrum extends to apices of precoxae. Antennae inserted near middle of eyes, and almost contiguous with inner margin of the latter; relative lengths of segments, 35 : 54 : 54 : 100; basal width of segment I slender. Pronotum across humeral angles $1\frac{1}{4}$ times as wide as long in the middle (56 : 45), and about twice as wide as across pronotal collar (56 : 27). Hemelytra almost linear at the sides. Cuneus triangular, three times as long as basal width (45 : 15); inner margin straight, slightly curved towards apex (Text-fig. 4); apex of cuneus falls short of membranous apex by more than two-thirds length of head. Membranous vein forming a right-angle at apex (Text-fig. 4). Length of body 4.1 mm., width across humeral angles 1.0 mm.

Colour. Head black, anteclypeus largely flavous. Antennal segment I brownish to fuscous, base flavous; the rest of antennae fuscous to black. Pronotum fuscous to black, calli darker, collar whitish. Scutellum black. Hemelytra stramineous; clavus black, except a stramineous streak on basal one-quarter of claval suture; inner margin of corium (except at base), apical margin of corium, continuing on to inner margin of cuneus, also membranous vein (except next to cuneus), fuscous; lateral margin of corium and cuneus brown. Venter largely dark brown to fuscous, basisternum somewhat paler. Legs stramineous; small spots on coxae, apices of posterior aspect of middle femora broadly, posterior aspect of hind femora largely, basal half of fore and middle tibiae, hind tibiae except at base and apex, and tarsi apically, brownish. Pubescence pale and shiny.

FEMALE. Structure. Head twice as wide as long (40 : 20); vertex twice as wide as an eye (23 : 11). Cuneus about $2\frac{1}{2}$ times as long as wide at base (45 : 19); apex of cuneus falls short of membranous apex by three-quarters length of head. Length of body 4.0 mm., width across humeral angles 0.97 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

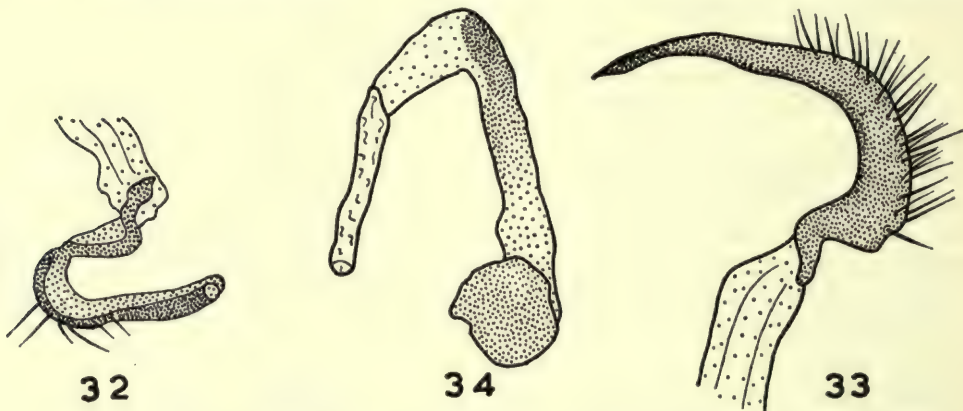
MATERIAL EXAMINED. GHANA (Gold Coast): 9 m. N. of Cape Coast, 1 ♂, 9.ix.1943 (H. E. Box) (Holotype). BRITISH CAMEROONS: Mungo River, nr. Tiko, 1 ♀, 14.i.1944 (H. E. Box) (Allotype). Both in B.M.

P. melanonotus is characterized by the structure of the eyes, the short rostrum, the insertion of the antennae, the relatively long pronotum, the more or less parallel-sided hemelytra, the rectangular membranal vein, and by the dark coloration. This species approaches *P. nimbus* in colour; but the colour of the head in the latter is orange, and its anteclypeus is dark.

***Prodromus kawandanus* sp. n.**

(Text-figs. 1, 32-34)

MALE. Structure. Head transverse, together with eyes nearly twice as wide as long in the middle (41 : 22); vertex more than twice as wide as an eye; as seen from in front, eyes projecting above vertex by one-third length of eye; eye peduncle



FIGS. 32-34. Male genitalia of *Prodromus kawandanus* sp. n.
32, left paramere; 33, right paramere; 34, aedeagus.

about half as long as eye width (6 : 11). Rostrum nearly reaching middle of meso-basisternum, and only a little short of bases of mesocoxae. Antennae inserted at lower margin of eyes, lower margin of antennal sclerites ventral to lower margin of eyes, antennae separated from eyes by a distance equal to half thickness of basal portion of segment I; relative lengths of segments, 25 : 51 : 49 : 73; slightly more than one-quarter of segment I slender. Pronotum across humeral angles about $1\frac{1}{2}$ times as wide as long in the middle (60 : 39), and more than twice as broad as across pronotal collar (60 : 27). Cuneus triangular, a little more than twice as long as broad at base (52 : 24); inner margin almost straight (Text-fig. 1); apex of cuneus falling short of membranal apex by a distance equal to length of head. Membranal vein nearly forming a right angle at apex (Text-fig. 1). Genitalia as shown in Text-figs. 32-34. Length of body 4.7 mm., width across humeral angles 1.08 mm.

Colour. General colour bright green, somewhat fading to greenish-yellow in old specimens. Antennal segments I and II reddish, base of segment I yellowish-green, middle of segment II sometimes dusky; segments III and IV fuscous, with a

reddish tinge. Claval commissures narrowly brownish. Membranal vein green. Apices of tibiae and tarsi pale ochraceous. Pubescence shiny white.

FEMALE. Unknown.

Holotype ♂. UGANDA: Kawanda, at mercury-vapour light, 4.vi.1959. *Paratypes*. Same locality as above, all at mercury-vapour light: 2 ♂, iv.1958; 3 ♂, vi.1958; 2 ♂, vii.1958; 1 ♂, 28.ix.1958; 1 ♂, 22.x.1958; 3 ♂, v.1959; 3 ♂, vi.1959.

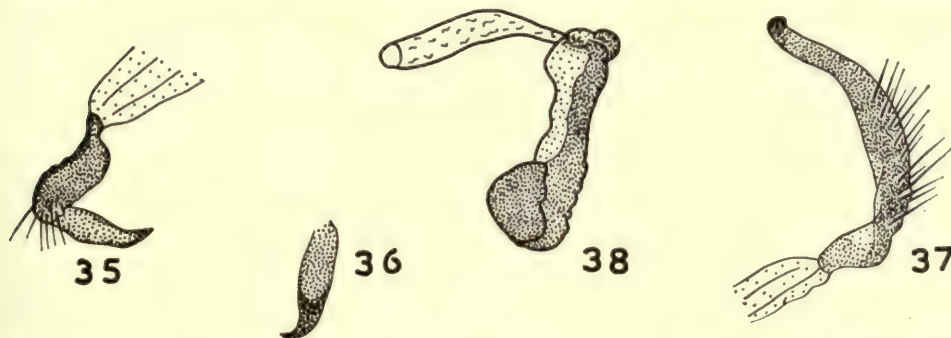
Holotype and four paratypes in B.M. The rest returned to Kawanda Research Station, Uganda.

P. kawandanus is at once distinguished from *P. aethiopicus* by its red antennal segments I and II, and by the subequal segments II and III. In *P. aethiopicus* only the apex of antennal segment II is red, and segment III is distinctly shorter than segment II.

Prodromus flavonotus sp. n.

(Text-figs. 5, 35-38)

MALE. *Structure*. Head transverse, together with eyes slightly more than twice as wide as long in the middle (40:18); vertex slightly more than twice as wide as an eye (25:11); from in front, eyes projecting above vertex by about one-third length



FIGS. 35-38. Male genitalia of *Prodromus flavonotus* sp. n. 35, left paramere; 36, apex of the same in external view; 37, right paramere; 38, aedeagus.

of eye; eye peduncle more than half as long as eye width (7:11). Rostrum extends to apices of fore coxae. Antennae inserted at lower margin of eyes, lower margin of antennal sclerites on the same level as lower margin of eyes, antennae separated from eyes by a distance less than half thickness of basal portion of segment I; relative lengths of segments, 24:50:64:104; basal one-third of segment I slender. Pronotum across humeral angles nearly as wide as it is long (50:48), and twice as broad as across pronotal collar (50:24); collar as strongly punctured as posterior lobe of pronotal disc. Scutellum very finely transversely rugose. Cuneus about three times as long as basal width (43:15); inner margin somewhat curved (Text-fig. 5); apex of cuneus falls short of apex of membrane by a distance equal to two-thirds length of

head. Membranal vein broadly rounded towards apex. Genitalia illustrated in Text-figs. 35-38. Length of body 3.9 mm., width across humeral angles 1.00 mm.

Colour. Head brown, sides and front yellowish-brown. Antennal segment I stramineous, apical one-third brown, extreme apex pale; the rest of antennae dark brown to fuscous, extreme apex of segment II reddish, segments III and IV with some reddish suffusion. Pronotum fuscous; a spot in the middle of the disc (including inner halves of calli) stramineous. Scutellum fuscous. Hemelytra pale greenish-yellow; claval inner margin and claval commissures fuscous; membranal vein greenish. Venter and legs stramineous; pro- and meso-epimera fuscous; apices of tarsi brownish. Pubescence pale, shiny.

FEMALE. Unknown.

Holotype ♂. GHANA: Nkawkaw, 5.vi.1943 (H. E. Box). In B.M.

Like *P. melanonotus*, this species has a very short rostrum, and the thorax is also dark in colour. But in *P. flavonotus* there is a pale spot in the middle of the pronotum, and the collar is uniformly dark. Moreover, the eye in the new species is not so peculiar in structure as in *P. melanonotus*, the structure of the antennae is different, the pronotum is longer, and the hemelytra are not extensively marked with dark areas.

Prodromus cochinensis sp. n.

(Text-fig. 9)

FEMALE. *Structure.* Head transverse, together with eyes about twice as wide as long in the middle (45 : 23), very densely covered with erect hairs; vertex $2\frac{1}{2}$ times as wide as an eye (30 : 12); as seen from in front, eyes projecting above vertex by nearly one-third length of eye; eye peduncle two-thirds as long as width of eye (8 : 92). Rostrum reaches bases of mesocoxae. Antennae inserted towards lower margin of eyes, separated from inner margin by a distance equal to half thickness of basal portion of antennal segment I; relative lengths of segments, 28 : 57 : 69 : 72; basal one-quarter of segment I slender. Pronotum across humeral angles $1\frac{1}{2}$ times as wide as median length (64 : 42), and a little more than twice as broad as across anterior collar (64 : 29). Cuneus elongated, a little more than three times as long as wide at base (50 : 15); inner margin curved (Text-fig. 9); apex of cuneus falls short of apex of membrane by a distance equal to half length of head. Membranal vein gently curved towards apex (Text-fig. 9). Length of body 4.7 mm., width across humeral angles 1.15 mm.

Colour. Head, anterior lobe of pronotum, and scutellum very pale ochraceous. Antennal segments I and II very pale ochraceous, apical one-quarter of segment II reddish; segments II and IV brownish. Posterior lobe of pronotum, and hemelytra, stramineous; clavus, inner and apical margins of corium, and membranal vein with a pale greenish tinge. Venter and legs stramineous; venter with pale ochraceous suffusion; apices of tarsi brownish. Pubescence shiny white.

MALE. Unknown.

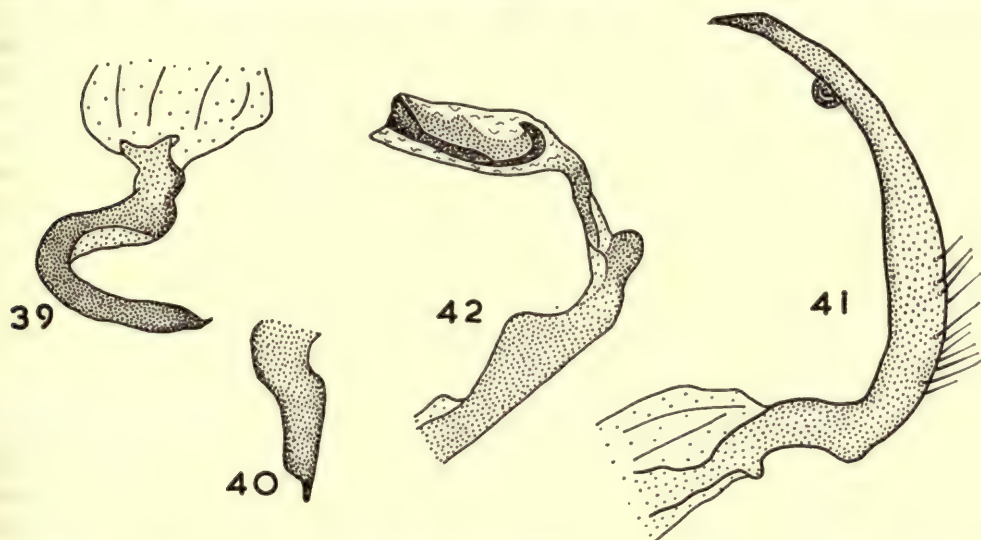
Holotype ♀. COCHIN STATE, on plantain leaves, 8.xi.1936 (Venkatasubban). In B.M.

The specimen was identified as *P. subflavus* in the British Museum collection. However, there is no doubt that it represents a new species (herein described as *P. cochinensis*) very close to *P. clypeatus*, from which it may be distinguished by the pale scutellum, and by the different proportional lengths of antennal segments.

***Prodromus pedunculus* sp. n.**

(Text-figs. 10, 39-42)

MALE. Structure. Head very long, from above appears transverse, together with eyes less than twice as broad as median length (46 : 26) ; vertex twice as wide as an



FIGS. 39-42. Male genitalia of *Prodromus pedunculus* sp. n. 39, left paramere ; 40, the same : outer aspect of apex ; 41, right paramere ; 42, aedeagus.

eye (26 : 13) ; anteclypeus distinctly swollen ; eyes very strongly projecting above vertex, as seen from in front projecting above vertex by half length of eye, from the side appears elongated ventrally ; eye peduncle nearly as long as width of eye (11 : 13). Rostrum extends to apices of precoxae. Antennae inserted towards lower margin of eyes, almost contiguous with eyes ; relative lengths of segments, 50 : 94 : 107 : (IV missing) ; nearly basal half of segment I slender. Pronotum across humeral angles $1\frac{1}{4}$ times as broad as long in the middle (68 : 54), and three times as wide as across pronotal collar (68 : 23). Cuneus long and narrow, $3\frac{1}{2}$ times as long as wide at base (68 : 20) ; inner margin strongly curved (Text-fig. 10) ; apex of cuneus nearly reaching apex of membrane, falling short by a distance equal to only one-fifth length of head. Membranal vein weakly curved towards apex (Text-fig. 10). Legs long and slender. Dorsum scantily pubescent. Genitalia illustrated in Text-figs. 39-42. Length of body 5.7 mm., width across humeral angles 1.22 mm.

Colour. Head and pronotum orange, anteclypeus sometimes reddish. Antennae brown or dark brown, slender portion of segment I stramineous. Scutellum stramineous. Hemelytra stramineous, inner margin and commissures of clavus sometimes orange. Venter stramineous, thorax with ochraceous markings, abdomen fuscous apically. Coxae stramineous to ochraceous; femora orange, with brownish markings towards apex; tibiae pale ochraceous or greyish-brown; tarsi stramineous, fuscous apically. Pubescence shiny white.

FEMALE. Unknown.

Holotype ♂. DUTCH NEW GUINEA: Cyclops Mts., Sabron, 930 ft., vi. 1936 (L. E. Cheesman). *Paratype* ♂. Humboldt Bay Dist., Bewan Mts., 400 metres, vii. 1937. Both in B.M.

The long eye peduncle and the elongated cuneus (which terminates near the apex of the hemelytral membrane) displayed in *P. pedunculus* apparently bridge the gap between *Prodromus* and *Sinervus*; but other characters—including the male genitalia—point to its being a good *Prodromus* species. Other salient features of *P. pedunculus* are: the long head; the swollen anteclypeus; the very long antennae; the long, slender, basal portion of antennal segment I; the narrow pronotum; and the long, slender legs.

***DUDUCORIS* gen. n.**

Small; general shape elongate, at least slightly widened at the sides, somewhat flattened dorsoventrally. Body covered with short, shiny white hairs. Head smooth, shiny; from above appears distinctly transverse, wider than pronotal collar; from the side appears vertical and inclined backwards, much shorter than high; vertex non-sulcate; frons swollen, blunt; anteclypeus distinctly swollen, delimited from frons by a deep depression and a transverse sulcus, anterior margin of anteclypeus sinuate when viewed from the side. Eyes sub-stylate, eye peduncle separated from dorsum of head by a slightly oblique longitudinal depression; eyes occupy less than half height of head; from the side and above they appear elongate, from above they appear kidney-shaped, ventral margin also slightly notched near the middle (Text-fig. 58). Antennae densely covered with short, semi-erect, shiny white hairs; segment I thickened but slender at base, the other segments linear in thickness, segment II about as thick as segment I at base, segments III and IV thinner. Pronotum densely (almost reticulately) punctate, the punctures somewhat shallow, disc shiny; posterior lobe hardly convex or declivous; calli flattened, hardly separated from each other by a median depression, obscurely punctate; collar thick, about as thick as antennal segment I; posterior margin of disc deeply emarginate, exposing mesoscutum, anterior margin of collar inwardly curved. Scutellum flattened, a little broader than long, smooth, with sparse hairs. Hemelytra semi-opaque, densely hairy, with very dense irregularly arranged fine punctures; sides at least a little widened at the sides; embolium equally wide throughout; cuneus triangular; membranal vein broadly rounded at apex or nearly quadrangulate, beset by minute shiny white pubescence. Legs short and thickened. Type-species: *Duducoris incisus* sp. n.

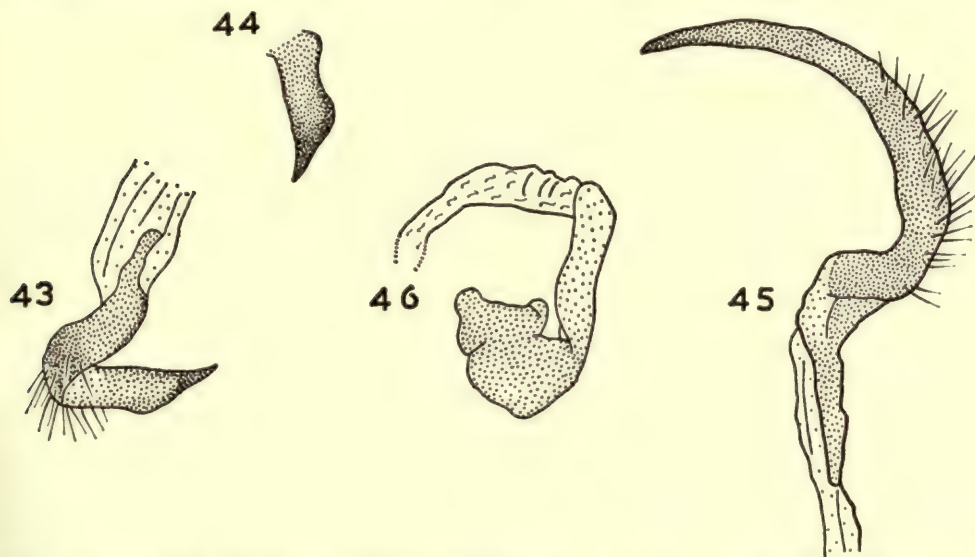
The new genus seems to be closely allied to *Prodromus*. But *Duducoris* can be

differentiated in that the body is flattened, the vertex is non-sulcate, the anteclypeus is much more swollen, the eyes only weakly project above the vertex, the first antennal segment is only shortly slender at base, the pronotum is deeply emarginate posteriorly, the calli are obscure, and in that the legs are short and robust.

Duducoris incisus sp. n.

(Text-figs. 43-46, 52 and 55)

MALE. *Structure.* Head, including eyes, nearly twice as wide as long in the middle (52 : 28) ; vertex slightly more than four times as wide as an eye (39 : 9) ; frons rounded in front ; eyes with lateral margins strongly curved when viewed from



FIGS. 43-46. Male genitalia of *Duducoris incisus* gen. et sp. n. 43, left paramere ; 44, the same : outer aspect of apex ; 45, right paramere ; 46, aedeagus.

above (Text-fig. 52). Rostrum extends to apices of procoxae. Antennae inserted at middle of eyes ; relative lengths of segments, 29 : 62 : 56 : 50. Pronotum across humeral angles about $1\frac{3}{4}$ times as wide as median length (68 : 35), and twice as wide as across anterior collar (68 : 35) ; posterior margin deeply emarginate, the emargination broadly rounded (Text-fig. 55) ; posterior lobe distinctly punctate, anterior lobe and collar obscurely so ; collar as thick as antennal segment I ; disc glabrous, except for minute hairs on a broad band along posterior margin. Hemelytra only slightly widened in the middle ; cuneus with inner margin slightly curved towards base. Genitalia illustrated in Text-figs. 43-46. Length of body 5.4 mm., width across humeral angles 1.22 mm.

Colour. General colour bright green. Head, scutellum, and thoracic venter yellowish-green. Apex of antennal segment II, also segments III and IV, ochraceous

or yellowish-green, with an obscure tinge of red on apex of segment II. Legs pale green, apices of femora and bases of tibiae narrowly suffused with red.

FEMALE. Structure. Head twice as wide as long (50 : 25); vertex $4\frac{1}{2}$ times as wide as an eye (36 : 8). Relative lengths of antennal segments, 28 : 54 : (III and IV missing). Relative dimensions of width across humeral angles of pronotum, median length of the latter, and width across pronotal collar, 67 : 36 : 33. Length of body 5.1 mm., width across humeral angles 1.21 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

Holotype ♂. EAST AFRICA: Uganda, Kawanda, at mercury-vapour light, 6.vii.1959. **Allotype** ♀. CONGO: Sakania, ix.1931 (Miss A. Mackie). **Paratypes.** Same data as for holotype: 1 ♂, 18.v.1958; 1 ♂, 22.x.1958; 1 ♂, 20.vi.1959.

The holotype, allotype and one paratype are in B.M. Two paratypes have been returned to Kawanda.

Duducoris angulatus sp. n.

(Text-figs. 47-51, 53, 56 and 58)

MALE. Structure. Head, including eyes, about $1\frac{2}{3}$ times as broad as long in the middle (43 : 27); vertex nearly three times as wide as an eye (28 : 10); frons somewhat truncate in front; eyes elongate when viewed from above, with lateral margins almost straight in the middle (Text-fig. 53). Rostrum reaches apices of middle coxae. Antennae inserted below middle of eyes with the lower margin of antennal sclerites just about on the same level as lower margin of eyes; relative lengths of segments, 31 : 60 : 37 : 65. Pronotum across humeral angles about $1\frac{1}{3}$ times as wide as median length (58 : 42), and about $1\frac{1}{2}$ times as wide as across anterior collar (58 : 32); posterior margin with the deeply emarginate portion angulate in the middle (Text-fig. 56); pronotal collar as distinctly punctate as on posterior lobe, calli obscurely punctate, collar thicker than antennal segment I; disc glabrous. Hemelytra widened in the middle (more distinctly so than in *D. incisus*); cuneus broadly triangular, inner margin straight. Genitalia illustrated in Text-figs. 47-51. Length of body 4.9 mm., width across humeral angles 1.04 mm.

Colour. General colour bright green, old specimens paler or ochraceous. Head and scutellum yellowish-green. Antennal segments II and III at apex broadly reddish, a band near middle and apical one-third of segment IV, reddish. Legs pale yellowish-green.

FEMALE. Structure. As in the male, except: relative lengths of antennal segments, 29 : 56 : 38 : 75.

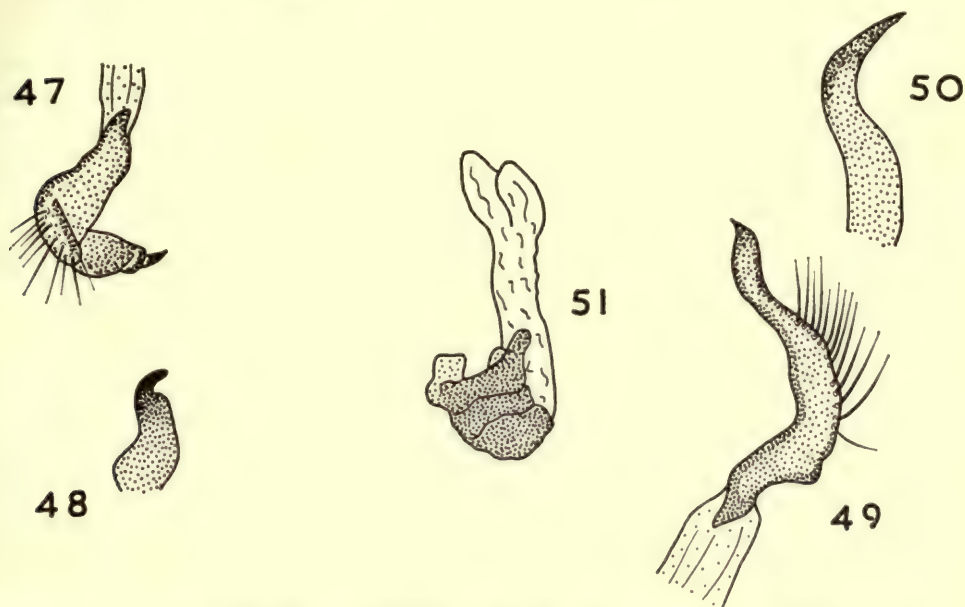
Colour. Similar to that of the male.

Holotypes ♂. EAST AFRICA: Uganda, Kampala, 14.xi.1930 (H. H. [argreaves]). **Paratypes.** Kawempe, nr. Kampala, 1 ♀, 8.v.1957. Kawanda, 1 ♀, 1.iv.1958; 1 ♂, 31.vi.1958 (both at light).

The holotype and one paratype are in B.M. Two paratypes have been sent to Kawanda.

This species differs from *D. incisus* in the structure of the male genitalia, particularly in (1) the twisted right paramere, and in (2) the apically hooked left paramere.

In external structure, *D. angulatus* is notable for the angulate emargination of the posterior margin of the pronotum, the relatively longer pronotum, the distinctly punctate collar, the elongate eyes, the short third segment of the antennae, the



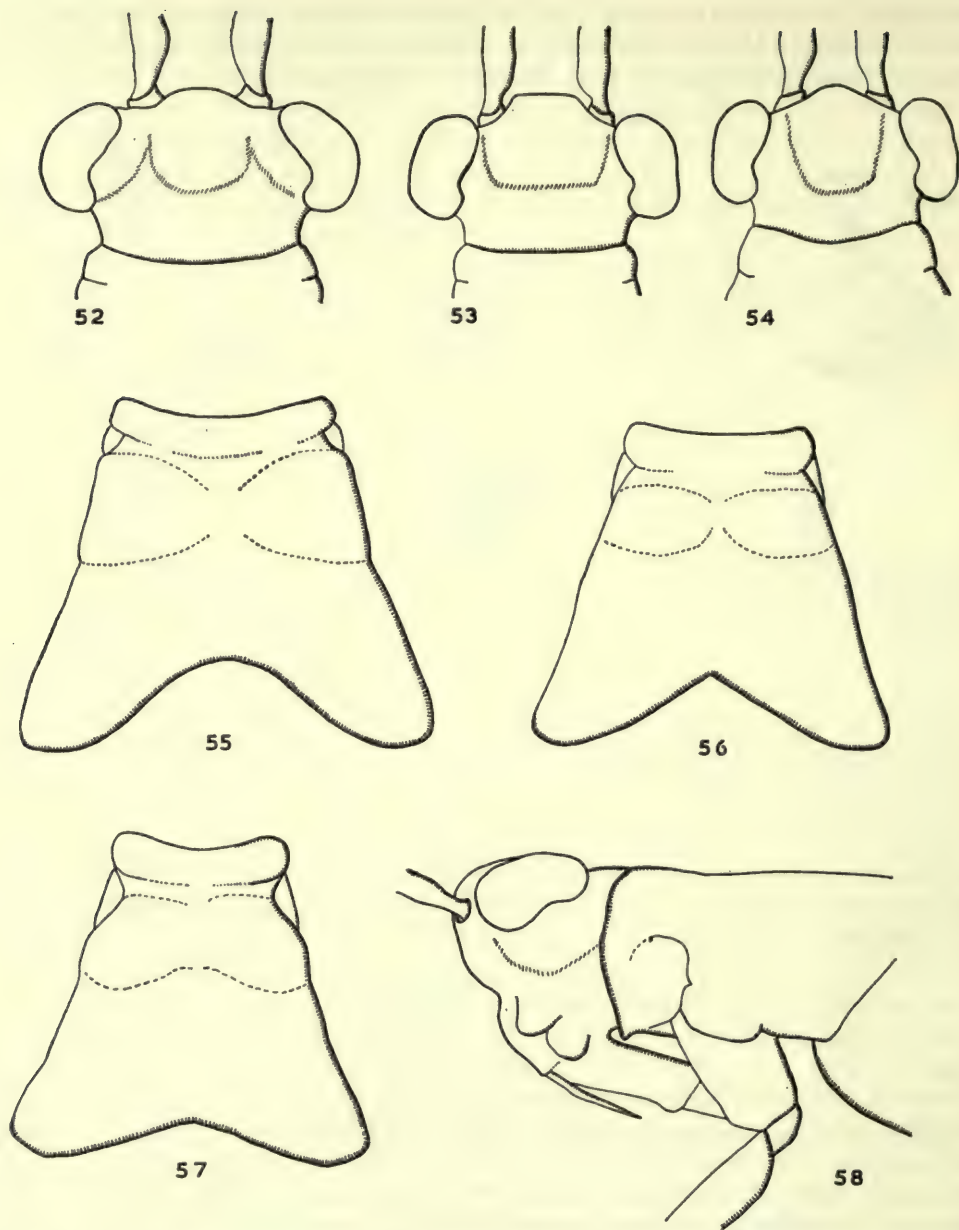
FIGS. 47-51. Male genitalia of *Duducoris angulatus* gen. et sp. n. 47, left paramere ; 48, the same : outer aspect of apex ; 49, right paramere ; 50, the same : inner aspect of apex ; 51, aedeagus.

different insertion of the antennae, the much longer rostrum, the narrower vertex, and the more distinctly expanded hemelytra. The colour of the antennae and legs is also different.

Duducoris pilosus sp. n.

(Text-figs. 54 and 57)

FEMALE. Structure. Densely pubescent, with moderately long hairs. Head, including eyes, $1\frac{1}{2}$ times as broad as long in the middle (40 : 26) ; vertex $3\frac{1}{2}$ times as wide as an eye (28 : 8) ; frons broadly rounded in front ; eyes elongate when viewed from above, with lateral margins almost straight in the middle (Text-fig. 54), as is the case in *D. angulatus*. Rostrum extends slightly beyond apices of middle coxae. Antennae inserted at lower margin of eyes, with lower margin of antennal sclerites slightly below lower margin of eyes ; relative lengths of segments, 31 : 62 : 40 : (IV lost). Pronotum across humeral angles more than $1\frac{1}{2}$ times as broad as long in the middle (59 : 43), and nearly twice as wide as across pronotal collar (59 : 31) ; posterior margin of pronotum emarginate, rather shallow, obtusely angulate (Text-fig. 57) ; collar about as thick as antennal segment I, nearly as distinctly punctate as on



FIGS. 52-58. External structure in *Duducoris* gen. n. Sculpturing and pubescence not shown. 52, dorsal aspect of head of *D. incisus* sp. n.; 53, the same for *D. angulatus* sp. n.; 54, the same for *D. pilosus* sp. n.; 55, dorsal aspect of pronotum of *D. incisus*; 56, the same for *D. angulatus*; 57, the same for *D. pilosus*; 58, lateral view of fore part of body of *D. angulatus*.

posterior lobe, calli obscurely punctate ; disc densely covered with erect, shiny white hairs. Hemelytra widened in the middle (as in *D. angulatus*) ; cuneus broadly triangular, inner margin straight. Length of body 5.0 mm., width across humeral angles 1.06 mm.

Colour. General colour bright green. Head, pronotum, and scutellum yellowish-green. Antennae yellowish-green ; segments I and II with irregular reddish markings, apices of segments II and III broadly red. Legs pale green.

MALE. Unknown.

Holotype ♀. EAST AFRICA : Uganda, Kawanda at light, 1.v.1958. In B.M.

D. pilosus is clearly allied to *D. angulatus*. But it may be distinguished from the latter by the following characters : the shallower and more obtuse emargination of the posterior margin of the pronotum, the narrower head, the broader vertex, the lower insertion of the antennae, and by the pubescence on the pronotum.

Genus *KUNUNGUA* Carvalho

Until recently, only two species of *Kunungua* were known : *K. boxi* Carvalho, the type species, from Ghana (West Africa), and *K. cinnamonea* Carvalho, from the Congo. A third species is now recognized from Ukerewe Is. in Lake Victoria, and it is described in the following paragraphs.

Kunungua ukerewensis sp. n.

(Text-figs. 59-61)

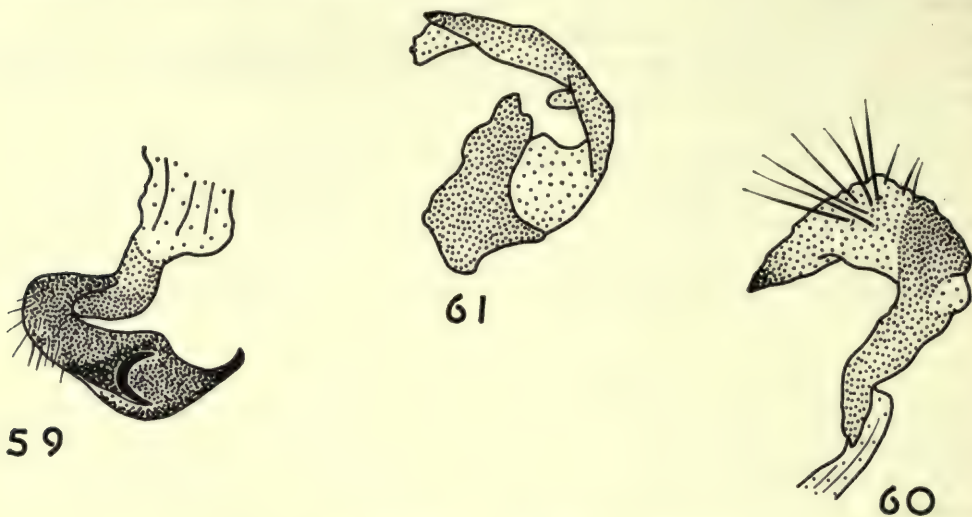
FEMALE. Structure. Head strongly transverse, together with eyes $3\frac{1}{2}$ times as broad as long in the middle (46 : 13) ; vertex more than four times as wide as an eye (35 : 8) ; frons blunt ; eyes from in front distinctly projecting above vertex, stylate, as seen from above eye peduncle slightly longer than width of eye. Rostrum extends slightly beyond apices of fore coxae. Relative lengths of antennal segments, 24 : 43 : 44 : (IV missing). Pronotum across humeral angles a little broader than median length (56 : 51), and more than twice as wide as across pronotal collar (56 : 25) ; calli prominently swollen, with a deep depression between them. Cuneus about $2\frac{1}{2}$ times as long as wide at base. Pubescence on body short. Length of body 3.9 mm., width across humeral angles 1.01 mm.

Colour. Head fuscous, anteclypeus and apices of juga yellowish-brown. Antennae dark brown to fuscous, base of segment I stramineous. Pronotum and scutellum fuscous, anterior collar extensively or largely pale yellowish-brown. Hemelytra stramineous ; clavus fuscous to black ; a band along inner margin of corium from about level of claval apex to apex of cuneus, also outer margin and apical half of cuneus, brown ; basal area of membrane, including nearly the whole cell, smoky brown. Venter fuscous to black. Coxae and bases of femora broadly stramineous ; the rest of the legs yellowish-brown, tibiae and tarsi paler, apices of tarsi fuscous.

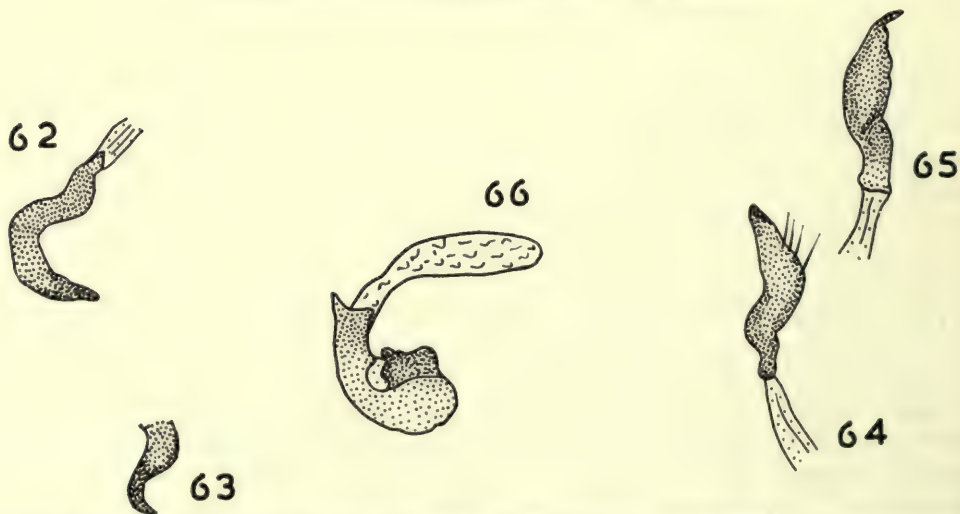
MALE. Structure. Relative lengths of antennal segments, 24 : 24 : (III and IV missing). Genitalia illustrated in Text-figs. 59-61. Otherwise, structure as in the female.

Colour. Similar to that of the female, except : legs largely stramineous.

Holotype ♀. EAST AFRICA : Tanganyika, Ukerewe Is. (L. Victoria) (Father Conrads). *Paratypes*. Same data : 1 ♂, 1 ♀.



FIGS. 59-61. Male genitalia of *Kunungua ukerewensis* sp. n.
59, left paramere ; 60, right paramere ; 61, aedeagus.



FIGS. 62-66. Male genitalia of *Kunungua boxi* Carvalho. 62, left paramere ; 63, the same : inner aspect of apex ; 64 and 65, right paramere ; 66, aedeagus.

The holotype is in B.M. The paratypes have been returned to the Coryndon Museum, Kenya.

The structure of the male genitalia in *K. ukerewensis* does not appear to be very close to that of *K. boxi*, the type species of the genus (Text-figs. 62-66). All other

characters of the new species, however, follow the diagnosis of *Kunungua*; and for this reason the species is assigned to this genus. Apart from the male genitalia, *K. ukerewensis* may be distinguished from the other two species of the genus (*K. boxi* and *K. cinnamonea*) by the relatively longer rostrum and cuneus, the different proportional lengths of antennal segments, the less prominent frons, and especially by the long eye peduncle. The colour of *K. ukerewensis* is also different, particularly that of antennae and pronotum.

Tribe ODONIELLINI

CHAMUS-complex

In his 1912 monograph of the Ethiopian Miridae Poppius propounded the following characters to distinguish *Chamopsis* from *Chamus*, namely that in *Chamopsis* (1) the last three antennal segments are almost without hairs, (2) that the body is densely granulate, (3) that the femora are glabrous, and (4) that the embolium is not transparent. Actually, these characters are not distinctive and grade into the condition found in *Chamus*; or, in the case of the first and third characters, probably result from the examination of a damaged or atypical specimen.

The present author's studies have now shown that, although *Chamopsis* is very closely related to *Chamus* it is nevertheless a good genus. New diagnostic characters have been found (see below). In his revision of the Ethiopian Bryocorinae, China (1944: 181) questioned the generic standing of *Chamopsis*. But, as we shall see later, the species which raised these doubts in his mind—originally described as *Chamus boxi* China—in fact belongs to *Chamopsis*.

Chamopsis

1. Frontal spines: the two outer ones in horizontal plane, and directed outwards, i.e. sideways (Text-figs. 73 and 74)
2. Hairs on antennal segment II to IV: about as long as or a little longer than width of antennal segment
3. Tarsal claw: with a prominent basal tooth

Chamus

- Two outer spines directed upwards (Text-figs. 67, 69 and 71).
- At least twice as long as width of antennal segment.
- Without such a prominent basal tooth.

The structure of the male genitalia does not help in the characterization of the three genera comprising the *Chamus*-complex (*Chamus*, *Chamopsis*, and *Parachamus*). Indeed, specific differences are only slight, except for *Chamus mefisto* and *Chamus conradianus* which have a distinctive vesica. Within the complex, *Chamus* and *Chamopsis* are very close together, while *Parachamus* stands a little apart—although all three genera exhibit a similar aspect, and undoubtedly form a distinct group within the tribe Odoniellini.

Chamus and *Chamopsis*

1. Pronotum dull, moderately or very densely pubescent
2. Pronotum without protuberances

Parachamus

- Shiny, very sparsely pubescent.
- With two large protuberances near basal lateral angles.

3. Calli on pronotum : not tuberculate . Tuberculate, i.e. conical in shape (Text-fig. 76).
4. Pubescence on antennal segment I : more . A broad area between the basal narrower or less uniformly hairy part and the apical thicker part without hairs.
5. Fore tibiae : with a distinct terminal spur, . Without a distinct spur (Text-fig. 79).
the spur forming one end of apical comb
of spines (Text-figs. 77 and 78).

Assignment to Genera of Species of the Chamus-complex

Species	Original assignment	Present genus
<i>bellus</i> Distant	. <i>Chamus</i> .	<i>Parachamus</i> (Schouteden, 1946).
<i>conradsianus</i> Schouteden	. <i>Chamus</i> .	<i>Chamus</i> .
<i>conradti</i> Reuter & Poppius	. <i>Chamopsis</i> .	<i>Chamopsis</i> .
(= <i>boxi</i> China)	<i>Chamus</i> .	<i>Chamopsis</i> .
<i>incertus</i> Reuter & Poppius	. <i>Chamus</i> .	<i>Chamus</i> .
<i>mefisto</i> Reuter & Poppius	. <i>Chamus</i> .	<i>Chamus</i> .
<i>overlaeti</i> Schouteden	. <i>Chamus</i> .	<i>Chamus</i> .
<i>reuteri</i> Poppius	. <i>Chamus</i> .	<i>Chamus</i> (?) ¹ .
<i>schroederi</i> Poppius	. <i>Chamus</i> .	<i>Chamus</i> . ¹
<i>tuberculatus</i> Distant	. <i>Chamus</i> .	<i>Chamopsis</i>
<i>wealei</i> Distant	. <i>Chamus</i> .	<i>Chamus</i> .
(= <i>ghesquierei</i> Schouteden)		

¹ Not examined in the present study.

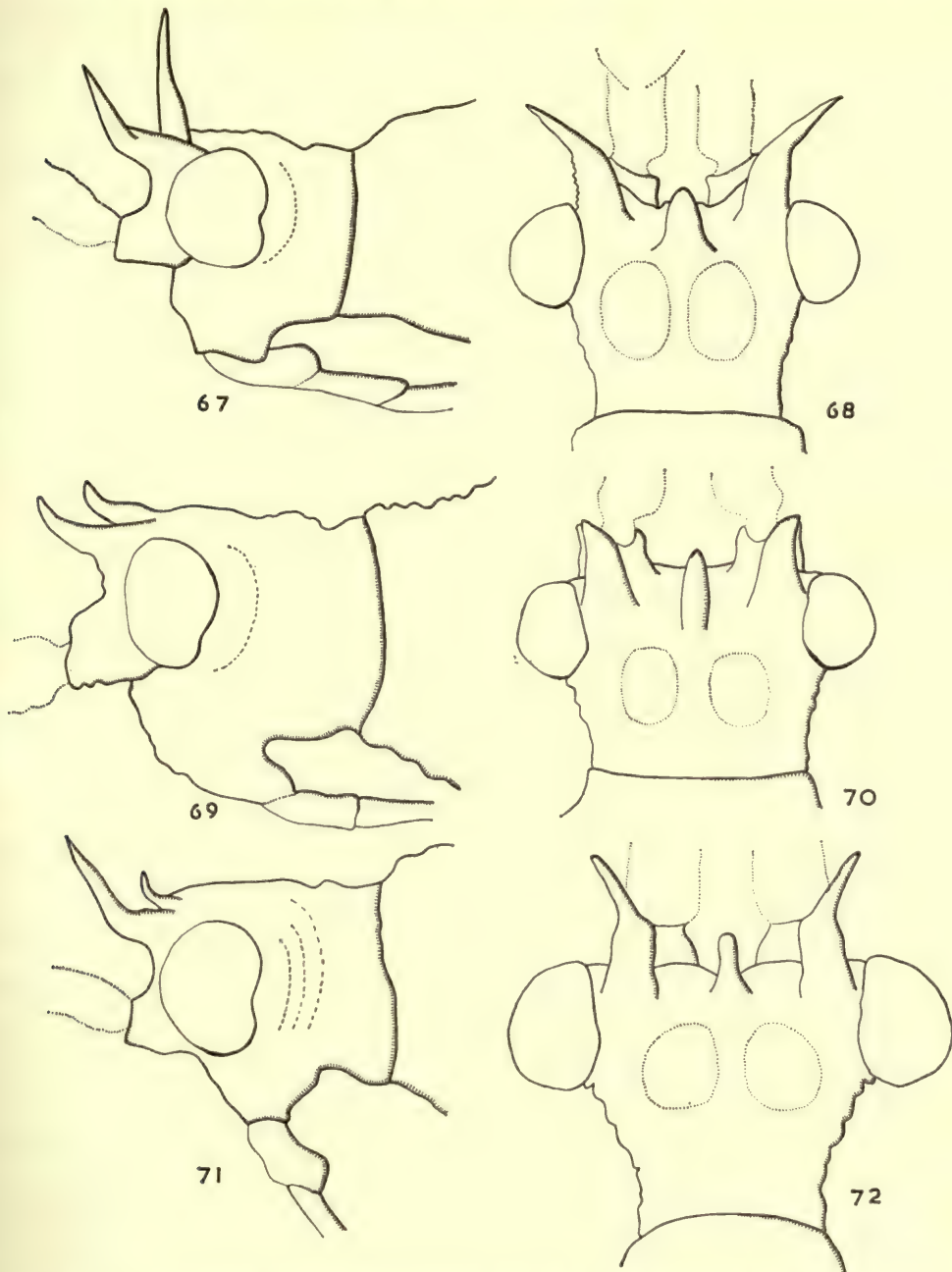
Re-descriptions of most of the species are given in the following pages.

CHAMUS Distant

1904. *Chamus* Distant, *Ann. Mag. nat. Hist.* (7) **13** : 197.

1912. *Chamus* Distant; Poppius, *Acta Soc. Sci. fenn.* **41** (3) : 192.

RE-DESCRIPTION. Body moderately shiny ; with long, erect, pale hairs ; dorsum more or less densely tuberculate. Head vertical ; viewed from above appears triangular in shape, broader than long, with the broadest part in anterior position ; from in front appears much broader than long ; from the side appears longer than high. Frons with three spines ; apical portion of the two lateral ones directed upwards, the middle one also directed upwards except when very short. Vertex with two large, roundish or oval, callus-like areas, clearly delimited by a ridge and a furrow ; glabrous. Anteclypeus swollen, indistinctly separated from frons. Eyes prominent, widely separated from each other, placed at anterior lateral angles of head. Rostrum short, reaching apices of fore coxae. Antennae inserted near lower margin of eyes ; antennal sclerites very prominent, developed as hollow cylinder-like structures (covering the thin basal part of antennal segment I) ; segment I strongly incrassate, thickest part broader than an eye, basal uncovered portion equally thickened, apical portion much more thickened and spindle-shaped, this segment densely

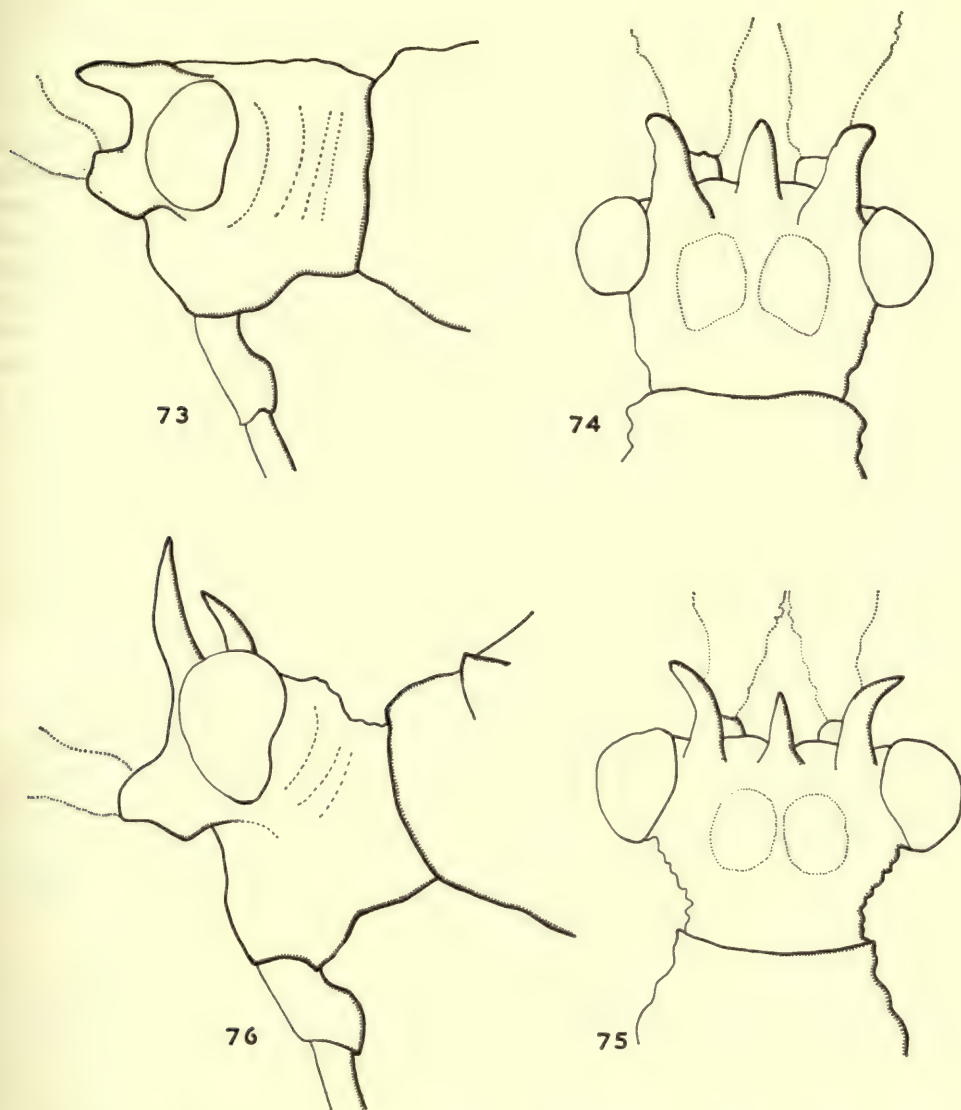


FIGS. 67-72. Structure of head, particularly that of frontal spines, in *Chamus* Distant. (Pubescence and sculpturing not shown.) 67, lateral aspect in *C. wealei* Distant; 68, the same: dorsal aspect; 69, lateral aspect in *C. incertus* Reuter & Poppius; 70, the same: dorsal aspect; 71, lateral aspect in *C. conradsianus* Schouteden; 72, dorsal aspect in *C. mefisto* Reuter & Poppius.

covered with long pointed scales arising from tubercles ; remaining segments thinner, with short sub-erect pale hairs and very long erect hairs, the latter twice as long as or longer than segmental thickness. Pronotum with posterior margin almost straight, much broader than anterior margin, broader than median length of disc ; disc tuberculate and carrying very long erect hairs, much more sparsely tuberculate than on anterior lobe ; calli non-tuberculate but irregularly swollen, also reaching sides of pronotum, but widely separated from each other ; posterior lobe convex. Scutellum a little broader than long ; with a semi-circular, shallow depression at base. Hemelytra somewhat flattened, with tubercles carrying long erect hairs, shorter sub-erect hairs also present ; corium with outer margin sinuate, strongly widened towards apex ; embolium relatively broad ; cuneus a little longer than wide ; membrane with a sharply angular vein, membrane and metathoracic wings very densely covered with very short adpressed pale hairs. Legs shaggy, densely covered with very long pale hairs, those on hind tibiae extremely long ; fore tibiae with a distinct terminal spur (Text-fig. 77) ; first two tarsal claws together distinctly shorter than the third. Type-species : *Chamus wealei* Distant.

KEY TO SPECIES OF *Chamus*

1. Hemelytral membrane with a large red band encircling apical angle of the cell, and a large red spot near middle of the latter 2
- Membrane without such red markings, or with only a small obscure red spot near apical angle of the cell 4
2. Median spine on frons long, reaching anterior level of lateral pair of spines. (Congo) *C. overlaeti* Schouteden
- Median spine on frons minute, or much shorter than the lateral pair 3
3. Lateral spines on frons with the thin apical portion directed sharply upwards ; antennal segment II twice as long as segment I ; hemelytra non-tuberculate. Pronotum with more than basal half of posterior lobe non-tuberculate. (Togo, Bambari, Kenya) *C. mefisto* Reuter & Poppius
- Lateral frontal spines somewhat curved outwards, not markedly directed upwards , antennal segment II less than twice as long as segment I ; hemelytra tuberculate. (Tanganyika) *C. reuteri* Poppius
4. Vertex about four times as wide as an eye ; scutellum, and also hemelytral membrane in the middle, fuscous. (Tanganyika) *C. schroederi* Poppius
- Vertex about three (or less) times as wide as an eye ; scutellum and membrane yellowish 5
5. Tubercles on pronotum of uniform size ; lateral spines on frons with the upwardly curved portion abruptly much thinner than the basal portion, median spine about half as long as lateral spine ; antennal segment IV about as long as segment I. (Ukerewe Is. (L. Victoria), Uganda) *C. conradsianus* Schouteden
- Pronotum with a dense covering of granulose tubercles and some distinctly larger, scattered tubercles ; lateral frontal spines more or less uniformly tapering to apices, median spine subequal to or a little shorter than lateral spine ; antennal segment IV shorter than segment I 6
6. Median frontal spine vertically curved upwards, lateral spines when viewed in profile as long as an eye is high ; on pronotum only the large tubercles are red. (S. Africa, Ukerewe Is., Congo) *C. wealei* Distant
- Median frontal spine weakly inclined upwards, lateral spines much shorter than eye is high ; the large tubercles and most granulose tubercles on pronotum red. (South Africa) *C. incertus* Reuter & Poppius



FIGS. 73-76. Structure of head, particularly that of frontal spines in *Chamopsis* Reuter & Poppius and *Parachamus* Schouteden. (Note: pubescence and sculpturing not shown.) 73, lateral aspect in *C. conradti* Reuter & Poppius; 74, the same: dorsal aspect; 75, dorsal aspect in *C. tuberculatus* (Distant); 76, lateral aspect in *P. bellus* (Distant).

Chamus wealei Distant

(Text-figs. 67, 68, 80-82)

1904. *Chamus wealei* Distant, *Ann. Mag. nat. Hist.* (7) **13** : 197.1942a. *Chamus ghesquierei* Schouteden, *Rev. Zool. Bot. afr.* **36** (1) : 88 (syn. n.).

MALE. *Structure.* Head, including frontal spines, with long bristly hairs, those on vertex directed mostly backwards ; head across eyes about $1\frac{1}{2}$ times as long as median length of head (including neck, but excluding frontal spines) ; vertex about $2\frac{1}{2}$ times as wide as an eye (34 : 13) ; eyes large, round ; lateral frontal spines directed forwards and then recurved sharply upwards, when viewed from the side about as long as an eye is high ; median frontal spine curved upwards, about as long as the lateral pair of spines (Text-figs. 67 and 68). Antennal segment I about as long as width of head ; relative lengths of segments, 10 : 20 : 12 : 7. Pronotum distinctly wider across humeral angles than long in the middle (29 : 20), and nearly three times as wide as across anterior collar (29 : 11) ; surface densely granulosely tuberculate, also with much larger sparsely distributed tubercles ; hairs arising from the granulose tubercles short and depressed, those from the large tubercles very long and sub-erect, all hairs posteriorly directed. Scutellum shiny, with tubercles carrying very long seta-like hairs ; short hairs also present. Hemelytra moderately densely covered with setigerous tubercles, particularly on clavus, apical half of corium, and inner one-third of cuneus ; long, backwardly directed hairs arising from tubercles and also present along external margin, hemelytra also densely covered with short depressed pubescence ; embolium slightly translucent. Genitalia illustrated in Text-figs. 80-82. Length of body 5.85 mm., width across humeral angles 1.51 mm.

Colour. General colour yellowish or stramineous, with reddish markings. Tubercles on antennae and body red, granulose tubercles yellowish. Pubescence yellowish-white, those on antennal segment I yellowish-brown or fuscous. Suffusions on posterior part of head, frontal spines extensively or largely, eyes, clavus irregularly, more than distal one-third of corium, suffusions on inner lateral margin of cuneus, membranal vein, sometimes a small obscure spot near apical angle of the cell, and sometimes irregular markings on abdomen, all reddish.

FEMALE. *Structure.* Vertex about three times as wide as an eye (38 : 13). Pronotum wider across humeral angles than long in the middle (34 : 22), and nearly three times as wide as across anterior collar (34 : 12). Relative lengths of antennal segments, 13 : 23 : (III and IV broken). Length of body 6.25 mm., width across humeral angles 1.71 mm. Otherwise, structure as in the male.

Colour. Similar to that of the female, except : specimen from Zululand with darker reddish markings on apical half of corium.

MATERIAL EXAMINED. SOUTH AFRICA : Cape Colony, 1 ♀ (M. Weale) (Holotype) ; Pondoland, Port St. John, 1 ♂, ix.1923 (R. E. Turner) ; Zululand, Empangeni, 1 ♀, 26.iv.1926 (R. E. Turner). All in B.M. EAST AFRICA : Ukerewe Is. in L. Victoria, 2 ♂ (Father Conrads). Returned to the Coryndon Museum, Kenya. CONGO : Rutshuru, 1 ♂, 16.iv.1937 (J. Ghesquière) (Holotype of *C. ghesquierei*). Returned to Musée du Congo, Belgium.

The type of *C. ghesquierei*, deposited in the Musée du Congo in Tervuren, was examined and there is no doubt that it belongs to *C. wealei*. The latter species resembles *Chamopsis tuberculatus* (Distant) in its type of sculpturing on the pronotum and hemelytra, but it is otherwise easily differentiated.

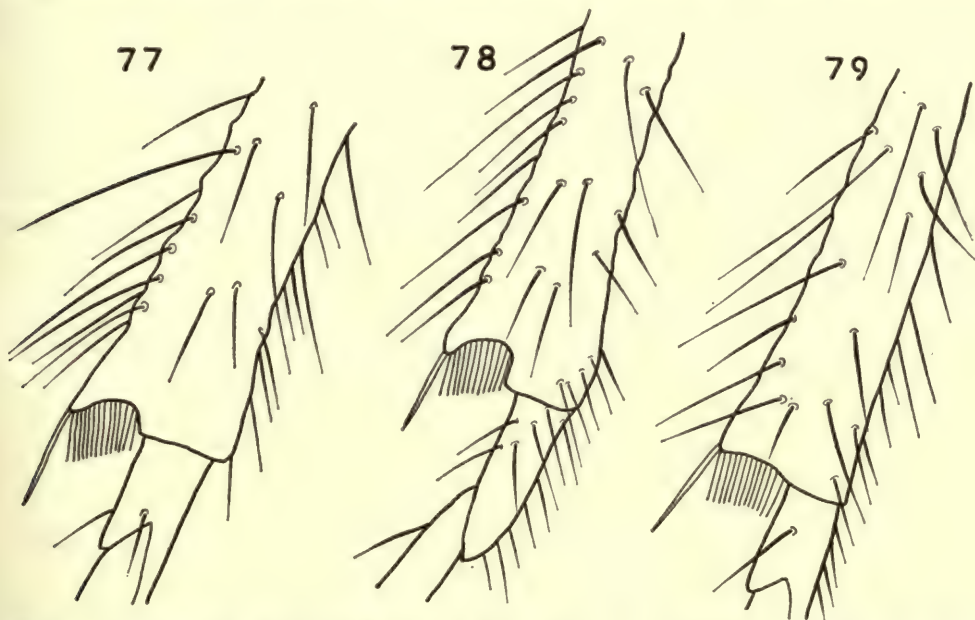
***Chamus incertus* Reuter & Poppius**

(Text-figs. 69, 70, 77, 83-85)

1911. *Chamus incertus* Reuter & Poppius, *Trans. R. ent. Soc. Lond.* **1911** : 414 ; pl. 32, fig. 5.

1912. *Chamus incertus* Reuter & Poppius ; Poppius, *Acta Soc. Sci. fenn.* **41** (3) : 193.

MALE. Structure. Head, including frontal spines, with long erect hairs, those on vertex directed mostly backwards ; head across eyes about $1\frac{1}{2}$ times as wide as it is



FIGS. 77-79. Shape of terminal spur on fore tibia. 77, in *Chamus incertus* Reuter & Poppius ; 78, in *Chamopsis conradti* Reuter & Poppius ; 79, in *Parachamus bellus* (Distant).

long in the middle (including neck, but excluding frontal spines) ; vertex more than $2\frac{1}{2}$ times as wide as an eye (32 : 12) ; eyes large, round ; lateral spines on frons only gently recurved upwards apically, when viewed from the side much shorter than an eye is high, from above nearly as long as an eye ; median spine only slightly inclined upwards, somewhat shorter than the lateral spines (Text-figs. 69-70). Antennal segment I about as long as width of head ; relative lengths of segments, 19 : 34 : 23 : (IV broken). Pronotum much wider across humeral angles than long in the middle (30 : 20), and nearly three times as wide as across anterior collar

(30 : 11) ; surface densely reticulately tuberculate, also with a few scattered but much larger tubercles ; the latter with very long sub-erect hairs, otherwise surface densely covered with short depressed or sub-erect hairs, most hairs directed posteriorly. Scutellum shiny, with a few scattered granulose tubercles carrying very long hairs, short hairs also present, all hairs directed backwards. Hemelytra moderately densely and uniformly covered with large setigerous tubercles, except apical half of cuneus, the setae very long and posteriorly directed ; a dense, short, depressed pubescence also present. Genitalia illustrated in Text-figs. 83-85. Length of body 5.4 mm., width across humeral angles 1.62 mm.

Colour. General colour of dorsum red. Pubescence pale in colour, yellowish-white or whitish, those on antennal segment I brownish with yellowish bases. Callus-like areas on vertex, frons, anteclypeus, ventral part of head, apex of antennal segment I, segments II and III wholly, base and apex of segment IV narrowly, irregular markings on pronotum, about basal half of embolium, external margin of cuneus, membrane, and legs, all yellowish or stramineous. Scutellum reddish-yellow. A band starting from inner basal angle of cuneus, continuing on to exocorium, and stopping one-third of the way from apex of corium, fuscous. Venter yellowish, suffused with red.

FEMALE. Structure. Vertex three times as wide as an eye (37 : 12). Relative lengths of antennal segments, 22 : 36 : 24 : 14. Pronotum much wider across humeral angles than long in the middle (35 : 22), and three times as broad as across pronotal collar (35 : 12). Length of body 6.65 mm., width across humeral angles 1.89 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

MATERIAL EXAMINED. SOUTH AFRICA : Cape Province, Mossel Bay, 2 ♀, iv. 1921 ; 1 ♂, 1 ♀, 18-30. xi. 1921 ; 1 ♂, xii. 1921 ; 1 ♀, ii. 1922 (R. E. Turner). In B.M.

Chamus mefisto Reuter & Poppius

(Test-figs. 72, 86-89)

1911. *Chamus mefisto* Reuter & Poppius, *Trans. R. ent. Soc. Lond.* **1911** : 414 ; pl. 32, fig. 6.

1912. *Chamus mefisto* Reuter & Poppius ; Poppius, *Acta Soc. Sci. fenn.* **41** (3) : 194.

MALE. Structure. Head and frontal spines with very long erect hairs ; head across eyes nearly $1\frac{3}{4}$ times as wide as it is long in the middle (including neck, but excluding frontal spines) ; vertex about twice as wide as an eye (38 : 18) ; eyes very large, round ; lateral pair of frontal spines with basal half thick and inclined forwards, distal half vertical and much thinner, when viewed from the side about two-thirds as long as an eye is high ; median spine minute, hardly inclined upwards (Text-fig. 72). Antennal segment I very nearly as long as width of head ; relative lengths of segments, 22 : 45 : 30 : 16. Pronotum distinctly wider across humeral angles than median length (36 : 23), and three times as broad as across pronotal collar (36 : 12) ; surface with proximal half of posterior lobe shiny, devoid of tubercles or hairs ; distal half and sides with small, rather indistinct, tubercles carrying moderately short, sub-erect hairs ; calli more or less smooth ; some long hairs on anterior half of pronotum ; all hairs posteriorly directed. Scutellum smooth, shiny, densely

covered with moderately long, sub-erect hairs. Hemelytra shiny, without distinct tubercles, densely covered with short, depressed hairs and some long, posteriorly directed hairs; cuneus about twice as long as wide. Genitalia illustrated in Text-figs. 86–89. Length of body 7.45 mm., width across humeral angles 1.89 mm.

Colour. General colour of dorsum red. Frons sometimes, the thin apical portion of lateral frontal spines, lateral parts of head below, anteclypeus, rostrum, base, inner middle and apex of antennal segment I, the remaining segments, a median streak on pronotum, posterior margin of pronotum, an inverted U-shaped band or more extensive area on the latter, a large area on middle of clavus, two large irregular markings on corium, middle two-fifths of embolium, also cuneus and membrane, all yellowish. Sides of pronotum and scutellum broadly, sometimes base of corium, and apex of corium broadly, dark red or fuscous. Base of cuneus narrowly, vein on membrane, a large spot near middle of the cell, and sometimes a band round apical angle of cell, red. Venter and legs yellowish or stramineous. Pubescence pale yellowish or white; those on antennal segment I pale, yellowish or sometimes tinged with brown, those towards base of segment more brownish.

FEMALE. Structure. Vertex more than twice as wide as an eye (41 : 18). Relative lengths of antennal segments, 23 : 47 : 29 : 14. Relative dimensions of width of pronotum across humeral angles, median length of pronotum, and width of pronotal collar, 30 : 19 : 9. Length of body 8.35 mm., width across humeral angles 2.16 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

MATERIAL EXAMINED. WEST AFRICA: Bambari, 2 ♂, 22.iv.1953 (Received from J. Carayon). In B.M. EAST AFRICA: Kenya, Nairobi, 1 ♂, 6.xi.1920 (A. F. J. Gedye); 1 ♀, 13.xi.1957 (R. Carcasson). Limuru, 2 ♀, v.1935. Returned to the Coryndon Museum, Kenya.

The male is described for the first time.

Chamus conradsianus Schouteden

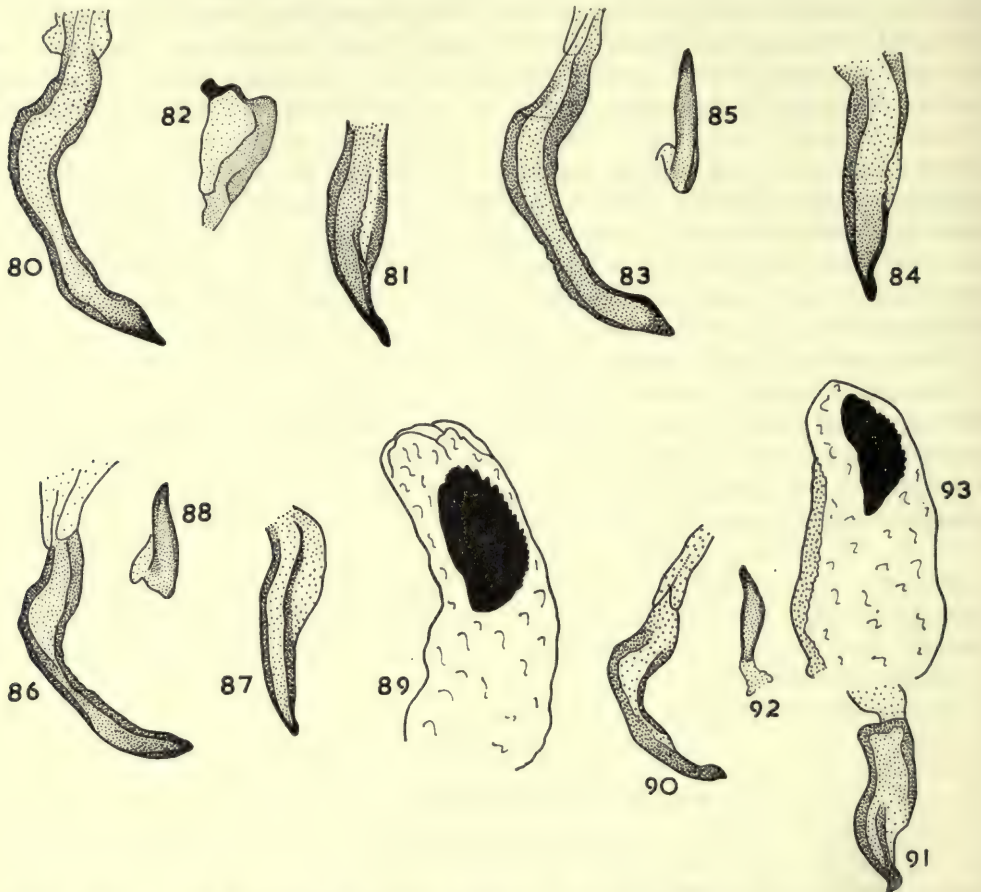
(Text-figs. 71, 90–93)

1942a. *Chamus conradsianus* Schouteden, *Rev. Zool. Bot. afr.* 36 (1) : 87.

Characterized by the relatively short first antennal segment, the structure of the frontal spines, the type of tuberculations on the dorsum, the structure of the tarsal claws, and by the colour, especially that of the tubercles and the sub-erect hairs.

MALE. Structure. Head and frontal spines with long erect hairs, those on vertex mostly directed backwards; head across eyes twice as wide as it is long in the middle (including neck, but excluding frontal spines); vertex twice as broad as an eye (32 : 16); eyes moderately large, round; lateral pair of frontal spines with basal half thick and inclined forwards, distal half sharply directed upwards and much thinner, viewed from the side a little longer than an eye is high; median frontal spine about half as long as the lateral pair, basal portion thickened and conical in shape, distal portion much thinner and sharply curved upwards (Text-fig. 71). Antennal segment I distinctly shorter than width of head (16 : 21); relative lengths

of segments, 16 : 37 : 24 : 15. Pronotum much wider across humeral angles than it is long in the middle (31 : 19), and three times as wide as across pronotal collar (31 : 10); surface densely covered with uniformly prominent tubercles carrying



FIGS. 80-93. Male genitalia in *Chamus* Distant. 80-82: *C. wealei* Distant. 80, left paramere; 81, the same: internal aspect of apex; 82, right paramere. 83-85: *C. incertus* Reuter & Poppius. 83, left paramere; 84, the same: internal aspect of apex; 85, right paramere. 86-89: *C. mefisto* Reuter & Poppius. 86, left paramere; 87, the same: inner aspect of apex; 88, right paramere; 89, aedeagus. 90-93: *C. conradsonianus* Schouteden. 90, left paramere; 91, the same: inner aspect of apex; 92, right paramere; 93, aedeagus.

rather long posteriorly directed hairs, a narrow area along posterior margin devoid of tuberculations. Scutellum weakly tuberculate; pubescence similar to that on pronotum. Hemelytra with low, scattered tubercles of uniform size on clavus, endocorium, apical one-third of corium, and inner basal half of cuneus; tubercles carrying rather long, posteriorly directed, sub-erect hairs; shiny white adpressed

pubescence also present. Tarsal claws with a rather distinct tooth. Genitalia illustrated in Text-figs. 90-93. Length of body 6.35 mm., width across humeral angles 1.66 mm.

Colour. General colour brownish-red. Adpressed pubescence shiny white; erect hairs brownish-yellow, those on antennal segments III and IV, sides and apical portion of pronotum, and apical one-third of corium, brownish or fuscous; scales on antennal segment I fuscous to black. Callus-like areas on vertex, frons or more extensively on anterior part of head, apical half of frontal spines, rostrum, antennal segments II and III, basal margin of pronotum broadly, scutellum largely, claval sutures narrowly, a triangular area on corium (excluding base and apical one-third), embolium (excluding base and apical one-third), cuneus (except inner basal angle and inner lateral margin), membrane, and legs, pale yellow. Basal lobe of pronotum, clavus, and apical one-third of corium sometimes, dark red. Tubercles concolorous. Venter yellowish, suffused with red.

FEMALE. Structure. Vertex more than twice as wide as an eye (36 : 14). Relative dimensions of pronotum across humeral angles, median length of pronotum, and width of pronotal collar, 36 : 19 : 11. Length of body 7.95 mm., width across humeral angles 1.87 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male, except: general colour of specimen from Ukerewe Is. distinctly red.

MATERIAL EXAMINED. EAST AFRICA: Ukerewe Is. on Victoria Nyanza, 1 ♀, v.1938 (R. P. Conrads) (Holotype); returned to the Musée du Congo, Tervuren, Belgium. Uganda, Kawanda, 3 ♂, 4 ♀ on *Tetracera potatoria* leaves, xi.1954 (M. Magala); same data, 1 ♀, 8.xii.1954 (M. Magala); 1 ♂ on *Erythrina*, 3.vii.1958 (T. R. Odhiambo). Three returned to Kawanda Research Station, the rest in B.M.

In the structure of the tarsal claws, and in the relatively short first antennal segment, *C. conradsianus* approaches the genus *Chamopsis*. However, it is not otherwise similar to *Chamopsis tuberculatus*, as implied in Schouteden's original description (Schouteden, 1942:87). *C. conradsianus* is, in fact, closely allied to *C. schroederi*, from which it may be separated by the colour, the structure of the head, vertex, antennae, and pronotum, and by the type of tuberculations on the dorsum. Like *C. mefisto*, the vesica has a chitinized structure (Text-fig. 93).

Chamus overlaeti Schouteden

1942. *Chamus overlaeti* Schouteden, *Rev. Zool. Bot. afr.* 36 (1): 88.

FEMALE. Structure. Head and frontal spines with very long, erect bristles; head across eyes slightly more than twice as broad as it is long in the middle (including neck, but excluding frontal spines); vertex $2\frac{1}{2}$ times as wide as an eye (43 : 17); eyes very large, round; lateral frontal spines curved outwards apically, almost horizontal, only very slightly directed upwards at apex; median frontal spine long, reaching anterior level of lateral spines, a little more distinctly directed upwards, viewed from above about three-quarters as long as an eye. Antennal segment I a little shorter than width of head; relative lengths of segments, 23 : 48 : (III and IV missing). Pronotum across humeral angles more than $1\frac{1}{2}$ times as wide as long in

the middle (31:19), and three times as wide as across pronotal collar (31:10); posterior lobe densely covered with coarse tubercles of uniform size, except a small non-tuberculate area near posterior margin; disc with very long sub-erect hairs, the latter as long as those on head, those along margins rather shorter. Scutellum and hemelytra (including cuneus) with large, rather indistinct, setigerous tubercles, also covered with very long sub-erect hairs, directed backwards, and shiny white depressed pubescence; cuneus about two-thirds as broad as it is long.

Colour. General colour of dorsum red. Anteclypeus, sides of head below, rostrum, some markings on antennal sclerites, apex of antennal segment I, segment II, a triangular area between and in front of pronotal calli, the non-tuberculate semi-circular area near posterior margin of pronotum, scutellum extensively, irregular markings on embolium, irregular spots on apical half of corium, cuneus wholly except for base and a streak near apex of membranal cell, and membrane, all yellowish. Membranal vein, a large spot near middle of the cell, and a band encircling apical angle of the cell, carmine red. A streak along embolio-corial boundary, and a band at apex of corium, dark reddish-brown. Venter and legs yellowish; dorsal margin of venter, and last visible abdominal segments, reddish. Hairs pale yellow, those on antennal segment I black.

MALE. Unknown.

MATERIAL EXAMINED. CONGO: Lulua, Sandoa, 1 ♀, v.1932 (F. G. Overlaet) (Holotype). Returned to Musée du Congo, Tervuren.

C. overlaeti is very similar to *C. mefisto* in general facies, but it may be distinguished in that: (1) the frontal spines are only weakly directed vertically; (2) the median frontal spine is much longer than in *C. mefisto*; (3) the lateral spines have a much thinner apical portion, in contrast to those in *C. mefisto*, in which the apical portion is abruptly slender; (4) the dorsum is more extensively covered with tubercles, which are in addition distinctly coarser; and in that (5) the head and dorsum are less extensively yellowish. Reference may also be given to Schouteden's 1942a paper, in which he compiled a long list of differences between *C. overlaeti* and *C. reuteri*, which he regards as closely related.

CHAMOPSIS Reuter & Poppius

1911. *Chamopsis* Reuter & Poppius, *Trans. R. ent. Soc. Lond.* **1911**: 416.
 1912. *Chamopsis* Reuter & Poppius; Poppius, *Acta Soc. Sci. fenn.* **41** (3): 195.
 1944. *Chamopsis* Reuter & Poppius; China, *Bull. ent. Res.* **35** (2): 174.

RE-DESCRIPTION. Dorsum covered with tubercles, from which arise moderately long hairs, mostly directed posteriorly. Head vertical, anterior part broadest; viewed from above and from in front appears distinctly broader than long, from the side about as long as high. Frons with three spines, all uniformly tapering towards apex; lateral pair recurved outwards, horizontally; median spine hardly inclined upwards. Vertex with two large oval callus-like areas, delimited by a furrow and a ridge, glabrous; anteclypeus swollen, indistinctly separated from frons. Eyes prominent, widely separated from each other, placed at anterior lateral angles of head. Rostrum slightly surpasses apices of fore coxae. Antennae inserted close

to lower margin of eyes ; antennal sclerites very prominent, cylinder-like structures enveloping base of segment I ; segment I strongly incrassate, distinctly shorter than width of head, basal uncovered portion more or less uniformly thickened, apical portion thickest and spindle-shaped, the latter broader than an eye, the segment densely covered with long pointed scales arising from tubercles ; the rest of antennae thinner than segment I, non-tuberculate, densely covered with depressed pubescence and scattered, rather long hairs, the latter less than twice as long as antennal thickness. Pronotum covered uniformly with setigerous tubercles ; calli non-tuberculate, but irregularly swollen, widely separated from each other, reaching sides of pronotum ; posterior lobe convex, posterior margin nearly straight. Scutellum somewhat broader than long, with a semi-circular shallow depression at base. Hemelytra somewhat flattened, with setigerous tubercles ; embolium relatively broad ; cuneus a little longer than wide ; membrane with an angular vein, very densely covered with minute pale pubescence. Legs densely hairy, hairs on tibiae very long ; anterior tibia with a distinct terminal spur (Text-fig. 78) ; first two tarsal claws together as long as, or slightly longer than, third segment ; claws with a large basal tooth. Type-species : *Chamopsis conradti* Reuter & Poppius.

***Chamopsis conradti* Reuter & Poppius**

(Text-figs. 73, 74, 78, 94-96)

1911. *Chamopsis conradti* Reuter & Poppius, *Trans. R. ent. Soc. Lond.* **1911** : 416 ; pl. 32, fig. 7.
 1912. *Chamopsis conradti* Reuter and Poppius ; Poppius, *Acta Soc. Sci. fenn.* **41** (3) : 195.
 1944. *Chamus boxi* China, *Bull. ent. Res.* **35** (2) : 180, fig. 9 (**syn. n.**).

Despite much enquiry in German museums the type of *C. conradti* has not been found. (It should have been in "Mus. Berol." i.e. Berlin Museum). It seems, therefore, that the original type is lost. Nevertheless, after carefully comparing the type material of China's species, *Chamus boxi*, with Poppius' re-description of *C. conradti*, the present writer has come to the conclusion that not only should China's species be transferred to the genus *Chamopsis*, but that it is synonymous with *C. conradti*.

There is no need to re-describe *C. conradti* anew, as China's description and figures, and the coloured plate provided by Reuter & Poppius should enable the species to be recognized easily. It may be added, however, that in this species the hemelytra are almost parallel-sided, and that the corium is not sinuate laterally.

MATERIAL EXAMINED (other than China's type material). EAST AFRICA : Uganda, Kawanda, 1 ♀ on *Erythrina micropteryx*, 7.ix.1956 (McNutt) ; 2 ♀ on *Combretum abbreviatum*, 18.iv.1959 (M. Magala). One in B.M., two returned to Kawanda Research Station.

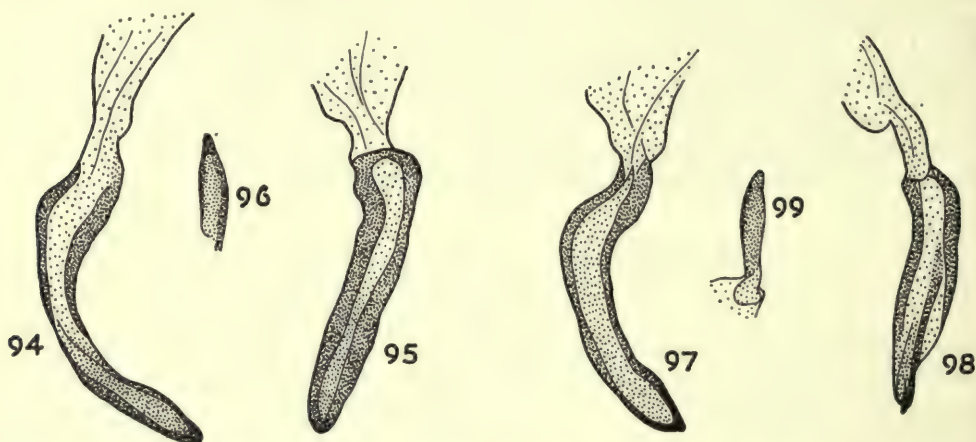
***Chamopsis tuberculatus* (Distant) comb. n.**

(Text-figs. 75, 97-99)

1918. *Chamus tuberculatus* Distant, *Bull. ent. Res.* **9** : 73.

MALE. *Structure*. Dorsum densely covered with adpressed pubescence. Head across eyes nearly twice as wide as it is long in the middle (excluding frontal spines) ; vertex

nearly twice as wide as an eye (27 : 14) ; eyes rather large, round ; median spine on frons reaching level of lateral pair, or nearly so (Text-fig. 75). Antennal segment I shorter than width of head (14 : 18) ; relative lengths of segments, 14 : 29 : 20 : 13. Pronotum distinctly wider across humeral angles than it is long in the middle (26 : 17), and $2\frac{1}{2}$ times as wide as across pronotal collar (26 : 10) ; surface densely covered with small granulate tubercles and scattered large tubercles carrying rather long sub-erect hairs. Scutellum shiny, tuberculations nearly indistinct, with long sub-erect hairs. Hemelytra with some large, scattered, setigerous tubercles ; corium feebly sinuate laterally. Genitalia illustrated in Text-figs. 97-99. Length of body 5.0 mm., width across humeral angles 1.37 mm.



FIGS. 94-99. Male genitalia in *Chamopsis* Reuter & Poppius. 94-96: *C. conradti* Reuter & Poppius. 94, left paramere ; 95, the same : inner aspect ; 96, right paramere. 97-99: *C. tuberculatus* (Distant). 97, left paramere ; 98, the same ; inner aspect ; 99, right paramere.

Colour. General colour of dorsum dull, brownish tinged with red. Sub-erect hairs stramineous, those on the dark areas along inner margin of cuneus brown to fuscous, scales on antennal segment I brownish. Head reddish-brown ; callus-like areas on vertex, frontal spines largely, frons, anteclypeus, rostrum, and antennal segments II and III, stramineous ; antennal segment III towards base dusky ; segment IV dark red, base and apex narrowly yellowish. Pronotum and scutellum yellowish-brown ; sides of both base and apex of scutellum, darker ; the large tubercles on pronotum dark. Hemelytra yellowish-brown ; base and apex of clavus, a broad band in the middle of the latter and on endocorium, also base of endocorium, apical one-third of corium (except lateral apical angle), inner basal angle of cuneus, and large irregular areas on membrane, fuscous, sometimes with reddish suffusion ; membranal vein red. Venter and legs flavescent, sides of thorax and abdomen dark reddish-brown.

FEMALE. Structure. Vertex somewhat more than twice as wide as an eye (30 : 13). Relative lengths of antennal segments, 14 : 30 : 22 : 12. Relative dimensions of

width of pronotum across humeral angles, median length of pronotum, and width of pronotal collar, 29 : 17 : 11. Length of body 5.9 mm., width across humeral angles 1.55 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

MATERIAL EXAMINED. CONGO : Kumulu, 1 ♂ off guava, 30.ix.1917 (R. Mayne) (Holotype) ; 2 ♂, 3 ♀, same data as above. All in B.M. EAST AFRICA : Uganda, Kampala and Kawanda, many specimens on guava and collected at mercury-vapour light. Ukerewe Is. (on L. Victoria), 1 ♂, 1 ♀ (Father Conrads). Returned to Coryndon Museum, Kenya. WEST AFRICA : Sierra Leone, Freetown, 1 ♀ on guava, 26.vii.1915 (E. Hargreaves). Nigeria, Awgu, 2 ♂, 3 ♀ nymphs on *Alchornea cordifolia*, 4.i.1944 (H. E. Box). In B.M.

As a result of the present studies, this species has been transferred to the genus *Chamopsis*.

PARACHAMUS Schouteden

1946. *Parachamus* Schouteden, *Rev. Zool. Bot. afr.* **39** (3) : 282.

1952. *Parachamus* Schouteden ; Villiers, *Hem. Afr. Noire* : 187.

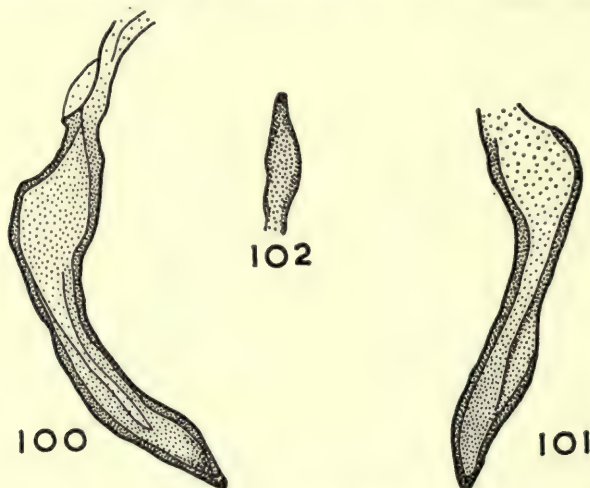
RE-DESCRIPTION. Dorsum very shiny. Seta-like hairs mostly directed posteriorly. Head viewed from above and from in front very strongly transverse, from the side higher than long ; head (including frons) with a few scattered seta-like long hairs ; head with a distinct neck. The three spines on frons curved vertically upwards (Text-fig. 76). Vertex with two large, glabrous, roundish, callus-like flattened areas, indistinctly delimited by a thin ridge, separated from each other by a shallow depression in the middle ; anteclypeus swollen, indistinctly marked off from frons. Eyes very prominent, widely separated from each other. Rostrum short, extending to apices of anterior coxae. Antennae inserted near lower margin of eyes ; the cylinder-like antennal sclerites very prominent, covering base of segment I ; segment I thickened (as in *Chamus*), about as long as width of head, covered very densely with long pointed scales arising from tubercles, a portion of the segment between the narrow basal part and the thicker distal part smooth and glabrous ; remaining segments thinner ; pubescence on the latter about as long as, or a little longer than, antennal thickness. Pronotum with anterior lobe much narrower than posterior lobe ; the latter convex, with two large protuberances located towards basal lateral angles ; calli conical in shape ; otherwise, disc almost non-tuberculate, and very sparsely hairy. Scutellum swollen, broader than long, with a shallow semi-circular depression near base. Hemelytra somewhat flattened, sparsely covered with setigerous tubercles, depressed pubescence on clavus and apical one-third of corium ; outer margin of corium sinuate ; cuneus somewhat longer than broad ; membrane very densely covered with minute pale pubescence, vein angular apically. Legs shaggy, tibiae with very long setae ; anterior tibia without a distinct terminal spur (Text-fig. 79) ; first two tarsal segments together longer than third segment ; claw without a distinct tooth. Type-species : *Parachamus bellus* (Distinct).

Parachamus bellus (Distant)

(Text-figs. 76, 79, 100-102)

1918. *Chamus bellus* Distant, *Bull. ent. Res.* **9** : 72, fig. 3.1946. *Parachamus bellus* (Distant) Schouteden, *Rev. Zool. Bot. afr.* **39** (3) : 283.1952. *Parachamus bellus* (Distant) ; Villiers, *Hem. Afr. Noire* : 187, fig. 262.

MALE. Structure. Dorsum sparsely covered with moderately long, seta-like hairs. Head across eyes more than twice as broad as long ; vertex three times as wide as an eye (22 : 7) ; spines on frons uniformly taper towards apex, lateral pair about as long as an eye is high when viewed from the side, median spine shorter (Text-fig. 76). Relative lengths of antennal segments, 23 : 37 : 23 : 10. Pronotum much wider



FIGS. 100-102. Male genitalia in *Parachamus bellus* (Distant). 100, left paramere ; 101, the same : inner aspect ; 102, right paramere.

across humeral angles than it is long in the middle (33 : 19), and three times as wide as across pronotal collar (33 : 11). Tubercles on hemelytra of more or less uniform size, most of these on clavus and apical one-third of corium. Genitalia illustrated in Text-figs. 100-102. Length of body 5.55 mm., width across humeral angles 1.67 mm.

Colour. Head, pronotum, scutellum, and their protuberances, fuscous to black ; sides of head towards apex, rostrum, antennal segments II and III, and base and apex of segment IV narrowly, flavescent ; antennal segments I and IV very dark red ; pubescence on antennae concolorous, those on segment I fuscous. Hemelytra flavescent ; clavus dark reddish-brown, except for an irregular area near apex, tubercles and setae fuscous ; and apical one-quarter of corium, also inner basal angle of cuneus, reddish-brown ; tubercles on pale areas concolorous and their setae pale brownish-yellow, those on dark areas fuscous or black ; membranal vein orange-red. Venter and legs ochraceous, sides of thorax fuscous.

FEMALE. Structure. Relative lengths of antennal segments, 23 : 36 : 24 : 13. Relative dimensions of width of pronotum across humeral angles, median length of

disc, and width across pronotal collar, 32 : 18 : 10. Length of body 5.65 mm., width across humeral angles 1.69 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

MATERIAL EXAMINED. CONGO : Eala, 1 ♂ off "Lionzi", 26.x.1917 (R. Mayne) (Holotype) ; 1 ♀, data as above (both probably teneral). In B.M. EAST AFRICA : Uganda, Kampala, 1 ♂, 1 ♀, iii.1935 ; nr. Kampala, 1 ♀ on *Alchornea* apparently feeding, 5.iii.1935 (all H. Hargreaves) ; Kawanda, 1 ♂, 27.ii.1954 (A. P. G. Michelmore). Two specimens returned to Kawanda Research Station. Ukerewe Is. (on L. Victoria), 6 ♂, 6 ♀ (Father Conrads). Four specimens returned to the Coryndon Museum, Kenya ; the rest in B.M.

LYCIDOCORIS Reuter & Poppius

1911. *Lycidocoris* Reuter & Poppius, *Trans. R. ent. Soc. Lond.* **1911** : 409.

1912. *Lycidocoris* Reuter & Poppius ; Poppius, *Acta Soc. Sci. fenn.* **41** (3) : 182.

RE-DESCRIPTION. Body elongate, with sides nearly parallel. Dorsum densely covered with sub-erect, posteriorly directed, moderately long hairs ; head, collar, and anterior lobe of pronotum, covered with erect hairs, those on head and pronotal collar sparse. Head smooth, shiny, strongly transverse, when viewed from the side somewhat shorter than high ; vertex with a roundish, shallow depression towards posterior margin ; frons inflated, projecting anteriorly between bases of antennae to about level of apices of antennal sclerites ; anteclypeus swollen, delimited from frons by a transverse depression. Eyes large, prominent, widely separated from each other, separated from anterior margin of pronotum by a distance about equal to thickness of pronotal collar. Rostrum short and thick, extending nearly to apices of fore coxae. Antennae inserted towards lower margin of eyes, segments thickened, very densely covered with sub-erect seta-like hairs, some of the latter erect ; segment I a little more than three times as long as thick, somewhat longer than vertex is wide ; segment II club-shaped distally ; segments III and IV spindle-shaped, segment III at least a little thicker than II, segment IV distinctly shorter than I. Pronotum very coarsely reticulately punctate, broader than long, posterior margin feebly sinuate, posterior lobe inclined anteriorly but scarcely convex, sides of anterior lobe more or less sinuate ; calli smooth, sharply delimited by a posterior furrow, calli extending to the sides of pronotum, confluent in the middle ; collar sharply separated off by a deep posterior furrow, flattened, less coarsely punctured than on pronotal disc. Scutellum a little longer than broad, coarsely reticulately punctured, in the middle with some ridges running in a more or less transverse direction between punctures, apex swollen and smooth. Hemelytra densely, irregularly, rugosely punctate ; embolium narrow ; cuneus much longer than broad, at least $1\frac{1}{2}$ times as long as broad ; membrane with several vein-like impressions extending from basal cell to apex of membrane in addition to the cubitus. Thoracic venter with elongated ostiolar peritreme. Legs shaggy, with very long bristles ; segments II and III of tarsi subequal, segment I longer. Type-species : *Lycidocoris mimeticus* Reuter & Poppius.

KEY TO SPECIES OF *Lycidocoris*

1. Setae on antennal segment II extremely long, about three times as long as thickness of the segment ; anterior lobe of pronotum, also venter, entirely black. (Kenya) *L. crinatus* sp. n.
- Setae on antennal segment II shorter, at most only slightly longer than thickness of the segment ; anterior lobe of pronotum as well as venter with at least some orange markings 2
2. Frons fuscous to black ; lateral margins of anterior lobe of pronotum very prominent 3
- Frons flavescent to orange ; lateral margins of anterior lobe of pronotum only slightly prominent 5
3. Tarsi entirely fuscous to black ; frons projecting slightly beyond apices of antennal sclerites ; vertex more than twice as wide as an eye 4
- Tarsi flavescent ; frons reaching apices of antennal sclerites ; vertex twice as wide as an eye. Antennal segment III about $1\frac{1}{2}$ times as thick as segment II. (Guinea) *L. simulans* sp. n.
4. Antennal segment III nearly $1\frac{1}{2}$ times as thick as segment II, which is slightly thicker than segment I ; cuneus only a little longer than broad ; pronotum and scutellum with a median narrow black band. (Northern Rhodesia) *L. tumidus* sp. n.
- Antennal segment III a little thicker than segment II, which is slightly thinner than segment I ; cuneus about $1\frac{1}{2}$ times as long as broad ; pronotum and scutellum with a broad black band, for the most part nine-tenths as wide as anterior margin of pronotum. (Uganda) *L. infulatus* sp. n.
5. Antennal segment II about five times as long as segment IV, and slightly thicker than segment I ; setae on antennal segment II shorter than the segment is thick. (Cameroons, Togo, Ghana, Congo, Angola, Uganda, Tanganyika) *L. mimeticus* Reuter & Poppius
- Antennal segment II about four times as long as segment IV, and slightly thinner than segment I ; a few setae near base of segment II a little longer than thickness of segment. (Ghana) *L. ghanaensis* sp. n.

Lycidocoris mimeticus Reuter & Poppius

(Text-figs. 103–106 and 123)

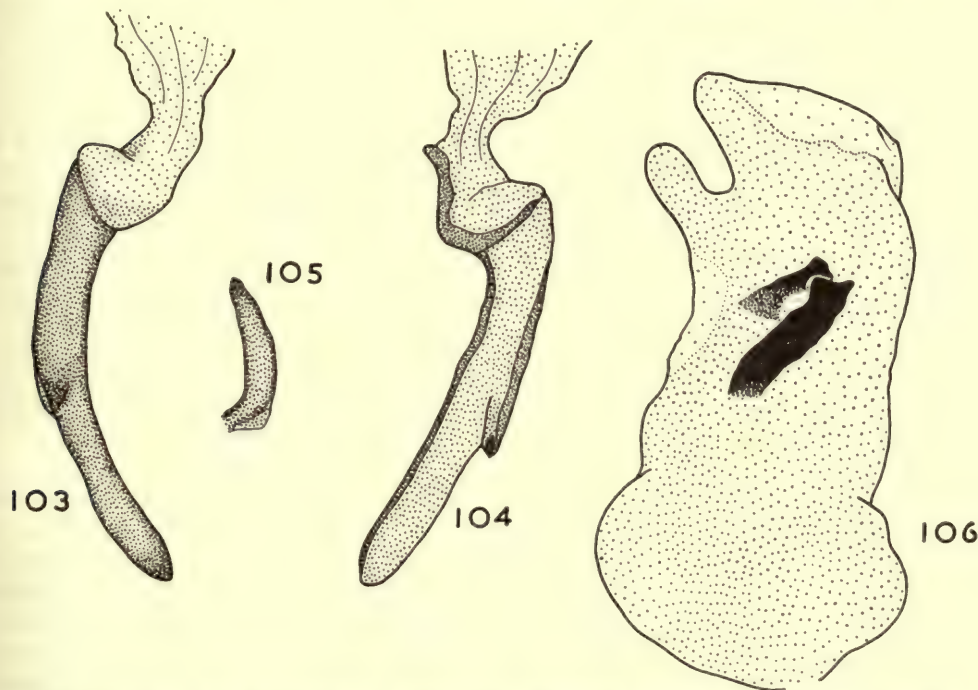
1911. *Lycidocoris mimeticus* Reuter & Poppius, *Trans. R. ent. Soc. Lond.* **1911** : 410 ; pl. 32, fig. 3.
1917. *Lycidocoris uniformis* Schumacher, *S. B. Ges. naturf. Fr. Berlin*, **1917** : 447 (syn. n.).
1942. *Lycidocoris mimeticus* Reuter & Poppius ; Schouteden, *Rev. Zool. Bot. afr.* **36** (1) : 1–4 (description of varieties).

The two nominal species, *L. mimeticus* and *L. uniformis*, are both very variable species ; and in fact, Schouteden (1942) has described several colour varieties. However, specimens standing over the name of "*L. uniformis*" in the British Museum collection definitely belong to *L. mimeticus*. And, as these specimens represent the coloration typical of *L. mimeticus* and *L. uniformis* (as described by Schumacher), it seems that the two species are conspecific. Furthermore, the characters given by Schumacher (1917) as distinguishing *L. uniformis* from *L. mimeticus* are not distinctive, viz.: (1) *L. uniformis* is smaller in size (there is no apparent difference in average size of the two species) ; (2) *L. uniformis* has more densely hairy antennae (there is no marked difference between the two species) ; (3) *L. uniformis* without a black band on pronotum and scutellum ; (4) the last antennal segment partly

reddish-yellow; and (5) the colour of the head and abdomen different from that in *L. mimeticus*. Actually, all gradations are found in colour markings between the two species. It is proposed, therefore, to sink *L. uniformis* as a synonym of *L. mimeticus*.

A re-description of the species follows.

MALE. Structure. Head across eyes twice as wide as it is long in the middle (39:19); vertex somewhat more than twice as wide as an eye (20:9); swollen projection of frons reaching apices of antennal sclerites. Relative lengths of antennal segments,



FIGS. 103-106. Male genitalia of *Lycidocoris mimeticus* Reuter & Poppius. 103 and 104, left paramere; 105, right paramere; 106, aedeagus.

25:76:51:15; segment II with setae shorter than thickness of segment; the latter slightly thicker than segment I, segments II and III about equally thick. Pronotum about $1\frac{1}{2}$ times wider across humeral angles than it is long in the middle (73:51), and three times as wide as across pronotal collar (73:24); lateral margin of anterior lobe as shown in Text-fig. 123. Genitalia illustrated in Text-figs. 103-106. Length of body 8.65-9.2 mm., width across humeral angles 2.47-2.52 mm.

Colour. General colour orange; colour markings very variable. Black or fuscous markings on: vertex, anteclypeus, sides of head largely, antennae except base of segment I and most of the distal part of segment IV, a median band on pronotum and scutellum (sometimes reduced or absent), cuneus almost wholly or only the apex or not at all, membrane, venter except small irregular areas along basisternum

continuing on to abdomen and also anterior half of dorsal margin of abdomen, and legs except apices of coxae, trochanters wholly, and tarsi, black or fuscous. Pubescence concolorous.

FEMALE. Structure. Head about twice as wide as long (41 : 21) ; vertex twice as wide as an eye (22 : 10). Relative lengths of antennal segments, 28 : 75 : 54 : 16. Relative dimensions of width of pronotum across humeral angles, median length of pronotum, and width across pronotal collar, 83 : 57 : 26. Length of body 9.45–11.35 mm., width across humeral angles 2.79–3.20 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

MATERIAL EXAMINED. WEST AFRICA : Cameroun, Baigom, 2 ♂, 3 ♀ on *Cafeier (arabica)* (Bamoun). French Togo, nr. Palime, 1 ♀, nymphs on *Coffea arabica*, 7.xii.1943 (H. E. Box). Ghana, Tafo, 1 ♀ on *Randia* sp., xii.1942 (H. E. Box). CONGO : Eala, 1 ♂, 2 ♀ on coffee, 25.x.1917 (R. Mayne). ANGOLA : Congulu, 1 ♂, iv.1934 (K. Jordan). EAST AFRICA : Uganda, Kamozi, 14 ♂, 13 ♀, 29.i.1928 (H. Hargreaves) ; Kampala, 3 ♀, x.1936 (A. F. J. Gedye) (returned to Coryndon Museum, Kenya) ; Toro, Bundibugyo, 1 ♂, 2 ♀ on coffee, 3.viii.1947 (A. P. G. Michelmores) ; Kakira, 2 ♂, 4 ♀ on *Coffea arabica*, 11.iii.1955 (Baldwin) ; Kawanda, 1 ♂ bred from coffee leaves, 19.xii.1952 (E. D. L. Matega) (four specimens returned to Kawanda Research Station).

Lycidocoris ghanaensis sp. n.

(Text-figs. 107–110 and 124)

MALE. Structure. Head across eyes more than twice as wide as it is long in the middle (37 : 17) ; vertex twice as wide as an eye (18 : 9) ; swollen projection of frons not reaching apices of antennal sclerites. Relative lengths of antennal segments, 23 : 75 : 51 : 18 ; segment II only a little thickened towards apex, setae shorter than the segment is thick, those near base somewhat longer than antennal thickness ; segment III very slightly thicker than segment I, the latter very slightly thicker than segment II. Pronotum about $1\frac{1}{2}$ times as wide across humeral angles as it is long in the middle (71 : 48), and three times as wide as across pronotal collar (71 : 23) ; lateral margins of anterior lobe as shown in Text-fig. 124. Genitalia illustrated in Text-figs. 107–110. Length of body 8.45 mm., width across humeral angles 2.29 mm.

Colour. General colour orange. Fuscous or black markings on : vertex, anteclypeus, sides of head, rostrum largely, antennae except apex of segment IV, or the latter almost wholly, a band on pronotum and scutellum, claval commissures, apex or apical two-fifths to two-thirds of cuneus, membrane, thoracic venter except a small area on probasisternum, abdomen entirely or excluding dorsal margin of proximal half and ventral part or more extensively, and legs except apices of coxae, trochanters entirely, and tarsi. Pubescence concolorous.

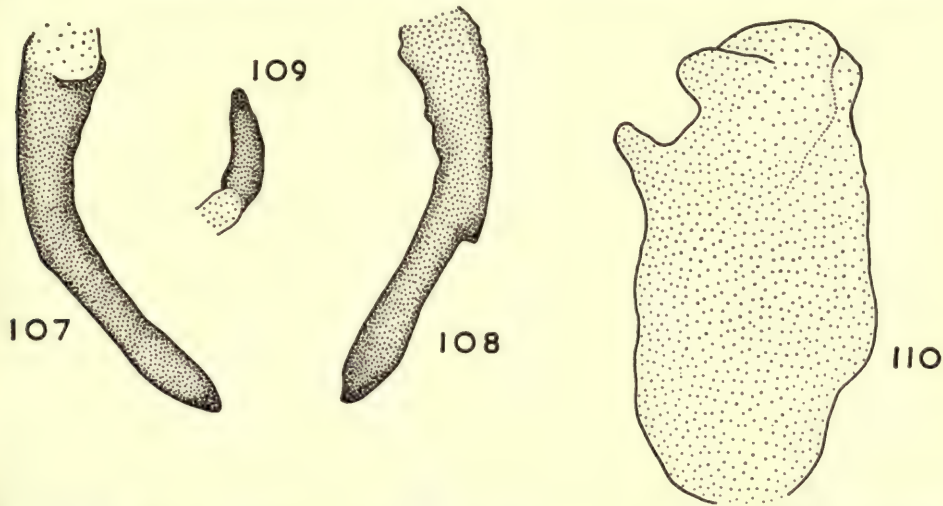
FEMALE. Structure. Head twice as wide as long (40 : 19) ; vertex twice as wide as an eye (21 : 10). Relative lengths of antennal segments, 25 : 77 : 54 : 18. Relative dimensions of width of pronotum across humeral angles, median length of pronotum, and width across pronotal collar, 76 : 53 : 26 (specimen from Cape Coast somewhat

larger). Length of body 10.25 mm., width across humeral angles 2.92 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

Holotype ♂. WEST AFRICA: Ghana, nr. Manso, Cent. Prov., on coffee sp. in primitive forest, 11.ix.1943 (H. E. Box). *Allotype* ♀. Ghana, nr. Cape Coast, nymphs on *Morinda lucida* in coastal scrub, 9.ix.1943 (R. E. Box). *Paratypes.* Ghana, Tafo, 1 ♂ on *Randia* sp., xii.1942; 1 ♂, data as for allotype; 1 ♀, data as for holotype (all H. E. Box). All in B.M.

L. ghanaensis appears to be very closely allied to *L. mimeticus*, except that in the former the antennal segment II is only a little more than four times as long as segment



FIGS. 107-110. Male genitalia of *Lycidocoris ghanaensis* sp. n. 107 and 108, left paramere; 109, right paramere; 110, aedeagus.

IV, in *L. mimeticus* it is about five times; segment II is thinner than segment I in *L. ghanaensis*; the setae on this segment are a little longer; and the shape of the anterior lobe of the pronotum is different.

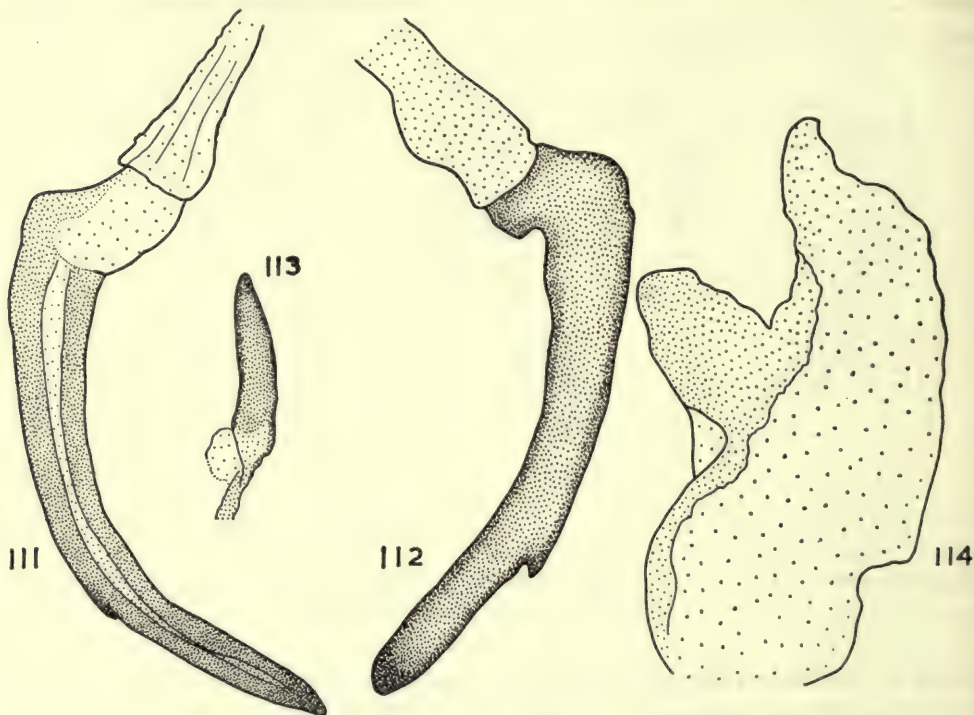
Lycidocoris infulatus sp. n.

(Text-figs. 111-114 and 128)

MALE. Structure. Head across eyes less than twice as wide as it is long in the middle (43:23); vertex more than twice as wide as an eye (23:10); swollen projection of frons slightly surpassing apices of antennal sclerites. Relative lengths of antennal segments, 30:98:70:(IV broken); setae on segment II shorter than antennal thickness; segment II slightly thinner than segment I, the latter slightly thinner than segment III. Pronotum about $1\frac{1}{2}$ times as wide across humeral angles as long in the middle (80:60), and three times as wide as across pronotal collar

(88:29); lateral margins of anterior lobe as shown in Text-fig. 128. Genitalia illustrated in Text-figs. 111-114. Length of body 11.55 mm., width across humeral angles 3.17 mm.

Colour. Head fuscous to black; juga and genae flavescent laterally. Rostrum and antennae black. Dorsum orange; a broad band on pronotum and scutellum (for the most part nine-tenths as wide as pronotal anterior margin), claval commissures, cuneus except base, and membrane, fuscous to black. Venter and legs black; ventral portion and sides of basal two-thirds of abdomen orange; trochanters fuscous. Pubescence concolorous.



FIGS. 111-114. Male genitalia of *Lycidocoris infulatus* sp. n. 111 and 112, left paramere; 113, right paramere; 114, aedeagus.

FEMALE. Structure. Head across eyes more than twice as wide as median length (46:20). Relative lengths of antennal segments, 30:97:69:(IV broken); segments I and II subequal in thickness. Relative dimensions of width of pronotum across humeral angles, median length of pronotum, and width across anterior collar, 92:63:30. Length of body 12.2 mm., width across humeral angles 3.35 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

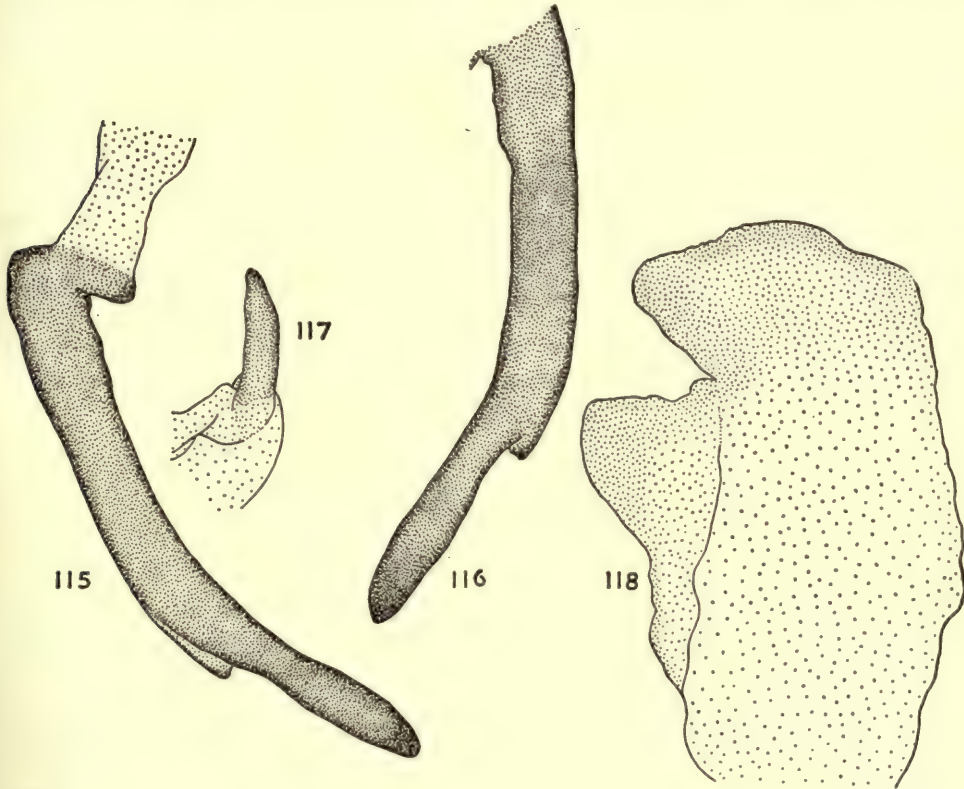
Holotype ♂. EAST AFRICA: Uganda, Entebbe, I-II.ix.1911 (S. A. Neave). *Allotype* ♀. Uganda, Kawanda, with eggs on *Randia fratum* (Rubiaceae), 19.viii.1939 (H. Hargreaves). Both in B.M.

L. infulatus is characterized by the more swollen frons, the relatively long antennal segment III, the very prominent lateral margins of anterior lobe of the pronotum, and by the colour, particularly that of the frons and tarsi, and the broad dark band on pronotum.

***Lycidocrois tumidus* sp. n.**

(Text-figs. 115-118 and 126)

MALE. Structure. Head across eyes slightly less than twice as wide as it is long in the middle (44 : 23) ; vertex more than twice as wide as an eye (23 : 10) ; swollen projection of frons slightly surpassing apices of antennal sclerites. Relative lengths



FIGS. 115-118. Male genitalia of *Lycidocrois tumidus* sp. n. 115 and 116, left paramere ; 117, right paramere ; 118, aedeagus.

of antennal segments, 29 : 97 : 68 : (IV broken) ; segment II slightly thicker than segment I, segment III much thicker than segment II (about $1\frac{1}{2}$ times as thick) ; setae on the latter nearly as long as antennal thickness. Pronotum more than $1\frac{1}{2}$ times as wide across humeral angles as long in the middle (100 : 61), and more than three times as wide as across pronotal collar (100 : 31) ; lateral margins of anterior

lobe of pronotum very prominent and non-punctate, illustrated in Text-fig. 126. Cuneus broad, only a little longer than broad. Genitalia shown in Text-figs. 115-118. Length of body 12.2 mm., width across humeral angles 3.60 mm.

Colour. Head black; juga and genae laterally largely flavescent or orange. Rostrum and antennae black. Dorsum orange; a narrow band on pronotum and scutellum, sometimes not reaching apex of the latter, apical one-third to two-fifths of cuneus, and membrane, black; claval commissure obscurely and narrowly brownish. Venter and legs black; probasisternum and basal two-thirds of abdomen orange; apices of coxae and trochanters largely fuscous. Pubescence concolorous.

FEMALE. Structure. Head about twice as wide as long (46 : 22); vertex distinctly more than twice as wide as an eye (26 : 11). Relative lengths of antennal segments, 31 : 99 : 68 : (IV broken). Relative dimensions of width of pronotum across humeral angles, median length of pronotum, and width across anterior collar, 117 : 71 : 32. Length of body 14.0 mm., width across humeral angles 4.09 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

Holotype ♂. NORTHERN RHODESIA: Congo border, Kipushi, 15.xii.1927 (H. Silvester Evans). *Allotype* ♀, same data. *Paratype* ♀, same data. All in B.M.

L. tumidus resembles *L. infulatus* very closely, especially in the colour of the head, frons, and tarsi. But in *L. tumidus* the third antennal segment is extremely thickened, and the cuneus is much broader than in any other *Lycidocoris* species (except *L. simulans*). As regards the greatly thickened antennal segment III, *L. tumidus* shows a condition similar to that found in the genus *Pantilioforma* Schumacher; consequently, this character, as a generic diagnostic character, breaks down.

Lycidocoris simulans sp. n.

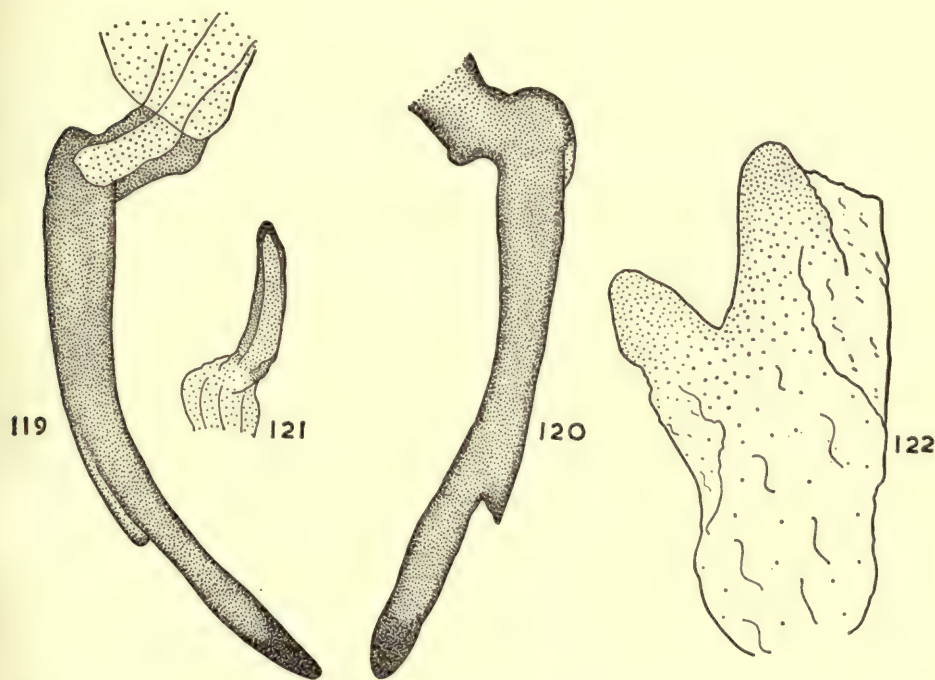
(Text-figs. 119-122 and 125)

MALE. Structure. Head across eyes distinctly more than twice as wide as it is long in the middle (40 : 17); vertex twice as wide as an eye (20 : 10); swollen projection of frons reaching apices of antennal sclerites. Relative lengths of antennal segments, 26 : 84 : (III and IV missing); segment II slightly thinner than segment I; the longer setae near base of segment II about as long as thickness of segment. Pronotum nearly $1\frac{1}{2}$ times as wide across humeral angles as long in the middle (78 : 54), and three times as wide as across anterior collar (78 : 25); lateral margins of anterior lobe very prominent, shown in Text-fig. 125. Cuneus broad, only a little longer than broad. Third tarsal segment shorter than second. Genitalia illustrated in Text-figs. 119-122. Length of body 10.0 mm., width across humeral angles 2.97 mm.

Colour. Head black; juga, lora partially, and genae extensively, orange. Rostrum and antennae black. Dorsum orange; a narrow band on pronotum and scutellum (except extreme apex), claval commissure narrowly, apical half or more of cuneus, and membrane, black. Venter and legs black; probasisternum, dorsal margin of thorax and proximal half of abdomen, and ventral portion of abdomen extensively,

orange; apices of coxae, also trochanters, fuscous; tarsi flavescent. Pubescence concolorous.

FEMALE. Structure. Head less than twice as wide as long (41:23); vertex twice as wide as an eye (21:10). Relative lengths of antennal segments, 29:89:61:(IV broken); segment III distinctly thicker than segment II (about $1\frac{1}{2}$ times as thick). Relative proportions of width of pronotum across humeral angles, median length of



FIGS. 119-122. Male genitalia of *Lycidocoris simulans* sp. n. 119 and 120, left paramere; 121, right paramere; 122, aedeagus.

pronotum, and width across anterior collar, 90:61:30. Length of body 11.0 mm., width across humeral angles 3.42 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male, except: only proximal half of ventral portion of abdomen orange (not "ventral portion of abdomen extensively" as in the male).

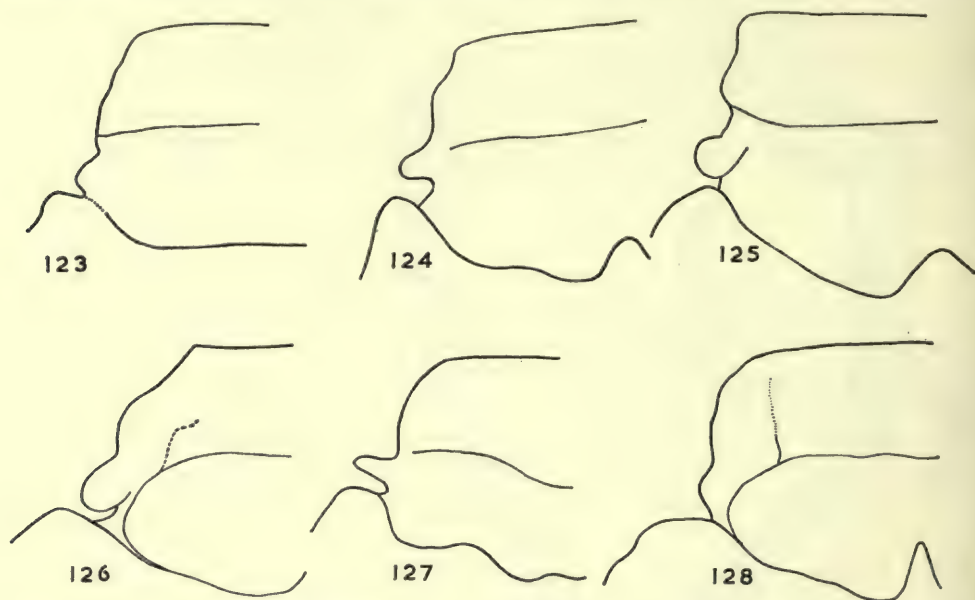
Holotype ♂. WEST AFRICA: Guinea, ex Quinquina (J. Carayon). **Allotype** ♀. Guinea, Seredou, ex Quinquina, xi.1946 (J. Carayon). **Paratypes.** 1 ♂, 1 ♀, same data as for allotype; Sierra Leone, Juri, 1 ♀, 21.viii.1912 (J. J. Simpson). All in B.M.

L. simulans is closely allied to *L. tumidus*, particularly in the structure of the antennae and cuneus, and in the colour of the head and dorsum. But *L. simulans* may be differentiated by the colour of the venter and tarsi, by the relatively shorter antennae, and by the narrower vertex.

Lycidocoris crinatus sp. n.

(Text-fig. 127)

FEMALE. *Structure*. Head across eyes nearly twice as wide as it is long in the middle (36 : 19) ; vertex about $2\frac{1}{2}$ times as wide as an eye (21 : 8) ; swollen projection of frons reaches apices of antennal sclerites. Relative lengths of antennal segments, 23 : 66 : (III and IV missing) ; segment II with only about apical one-fifth thickened,



FIGS. 123-128. Left lateral margin of anterior lobe of pronotum in the genus *Lycidocoris* Reuter & Poppius. 123, *L. mimeticus* Reuter & Poppius ; 124, *L. ghanaensis* sp. n. ; 125, *L. simulans* sp. n. ; 126, *L. tumidus* sp. n. ; 127, *L. crinatus* sp. n. ; 128, *L. infulatus* sp. n.

and here slightly thinner than segment I ; setae on antennae long, those on segment II extremely long and about three times as long as thickness of segment. Pronotum about $1\frac{1}{2}$ times as wide across humeral angles as long in the middle (74 : 49), and about three times as wide as across anterior collar (74 : 24) ; furrow between collar and calli very deep ; lateral margins of anterior lobe of pronotum as illustrated in Text-fig. 127. Setae on legs very long. Length of body 9.6 mm., width across humeral angles 2.63 mm.

Colour. Head black ; juga, lora, and genae narrowly, fuscous. Rostrum and antennae black. Dorsum orange ; anterior pronotal lobe entirely, a narrow band on pronotum and scutellum, claval commissures narrowly, sometimes endocorium and inner half of cuneus, and membrane, black. Venter and legs black ; first and second tarsal segments stramineous, third segment fuscous. Pubescence concolorous, those on the darker parts of corium and cuneus orange in colour.

MALE. Unknown.

Holotype ♀. EAST AFRICA: Kenya, NW. Mau, 8-10,000 ft., i-ii. 1946. In B.M. *Paratype* ♀, same data. Returned to the Coryndon Museum, Kenya.

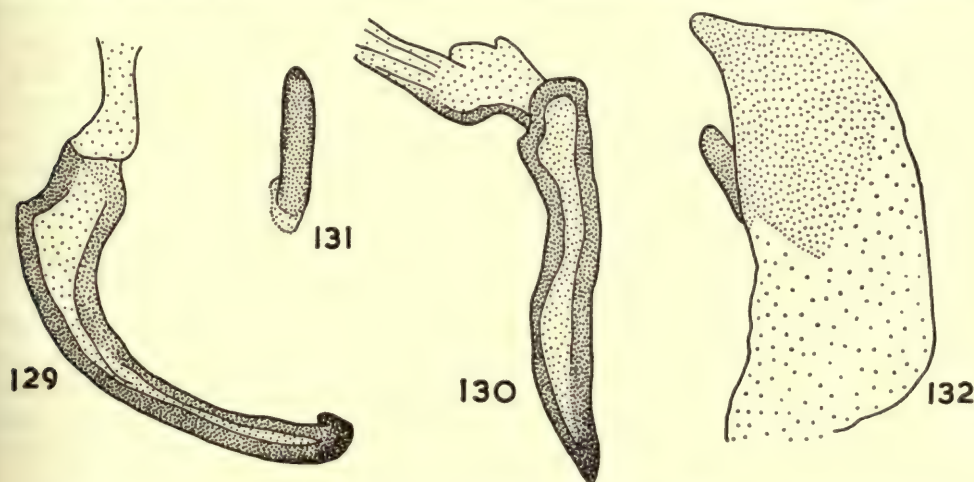
This species is immediately recognized by the very long hairs on antennae and legs, the relatively short antennal segment II, its peculiar thickening, the structure and colour of the anterior pronotal lobe, and by the black venter.

PANTILIOFORMA Schumacher

1917. *Pantilioforma* Schumacher, *S. B. Ges. naturf. Fr. Berlin*, 1917: 447.

Type-species: *P. impressopunctata* Schumacher.

As presently constituted, the genus *Pantilioforma* consists of three species: *P. impressopunctata* Schumacher, *P. thoracicus* (Distant), and *P. modestus* (Distant)—



FIGS. 129-132. Male genitalia of *Pantilioforma modestus* (Distant). 129, left paramere; 130, the same: internal aspect; 131, right paramere; 132, aedeagus.

the latter two having been transferred from *Lycidocoris* by China (1944: 179-180). The three species may be distinguished as noted below:

<i>P. impressopunctata</i>	<i>P. thoracicus</i>	<i>P. modestus</i>
1. Pronotum about $2\frac{1}{2}$ times as wide across humeral angles as across anterior margin	. As in <i>impressopunctata</i>	. A little more than three times as wide across humeral angles as across anterior margin.
2. Pronotal collar as thick as an eye is wide	. As in <i>impressopunctata</i>	. Thinner than an eye is wide.
3. Cuneus much longer than wide	. As in <i>impressopunctata</i>	. About as long as wide.
4. Scutellum distinctly shorter than wide	. A little longer than wide	. A little shorter than wide.

On balance, *P. modestus* seems to be distinct from the other two species. Schouteden (1946 : 275) holds a similar view ; and in fact retains *P. modestus* in his genus *Ealincola*, which is otherwise synonymous with *Pantilioforma*. China (1944 : 179), however, regards *P. thoracicus* as the more isolated species, because of the structure of the scutellum. Since the structure of the male genitalia is known only in *P. modestus* (see Text-figs. 129-132), we will have to leave this question until such time as the male has been discovered in the other two species. For the present, all three species are left in the genus *Pantilioforma*.

BRYOCOROPSIS-SAHLBERGELLA-complex

Schouteden (1935) first drew attention to this complex, and understood it as comprising the genera *Bryocoropsis* Schumacher and *Sahlbergella* Haglund. In 1944 China added two more genera, *Idioaspis* China and *Distantiella* China (the latter proposed for *S. theobroma* Distant). The four genera are very closely related ; indeed, China (1944 : 188) considered regarding them as a single genus ; and Schouteden (1935 : 473) before him had also considered *Bryocoropsis* and *Sahlbergella* to be one genus. Three more genera are now being added to this complex : *Odoniella* Haglund, *Pseudodoniella* China & Carvalho, and *Yangambia* Schouteden (= *Idioaspis*).

In all these genera the scutellum is inflated, and the frons is swollen and usually possesses distinct protuberances. They are also associated with cacao, except, apparently, in the case of *Yangambia*.

A peculiar character, common to all the six genera of the complex, has been recently noted by the present writer, viz. the hemelytral membrane has a dense pale pubescence consisting of very minute scale-like hairs. It is tempting to use this as a diagnostic character for the complex. However, until all genera within the tribe have been examined, and the usefulness and reliability of this character has been attested, we shall merely draw attention to it.

ODONIELLA Haglund

1895. *Odoniella* Haglund, *Öfvers. VetenskAkad. Förh., Stockh.* : 468.
 1905. *Odoniella* Haglund ; Reuter, *Öfvers. finska VetenskSoc. Förh.* **47** (10) : 2.
 1911. *Odoniella* Haglund ; Reuter & Poppius, *Trans. R. ent. Soc. Lond.* **1911** : 411.
 1912. *Odoniella* Haglund ; Poppius, *Acta Soc. Sci. fenn.* **41** (3) : 185.

KEY TO SPECIES OF *Odoniella*

- | | |
|--|----------------------------------|
| 1. Dorsum with dark markings | 2 |
| -. Dorsum uniformly red or orange, except sometimes apex of membrane | 5 |
| 2. Pronotum with black markings | 3 |
| -. Pronotum without dark markings | 4 |
| 3. Calli on pronotum black ; corium extensively black, especially on exocorium.
(Cameroons) | <i>O. reuteri</i> Haglund |
| -. Calli and corium concolorously orange. (Benjon) | <i>O. immaculipennis</i> Poppius |

4. Corium with at least apical half fuscous to black ; membrane broadly fuscous apically ; scutellum without dark markings ; antennal segment II uniformly pale in colour, about four times as long as segment I ; tarsal claws with a tooth. (Ghana, Camerouns, Ivory Coast) ***O. rubra*** Reuter
- Corium without dark markings ; membrane with only a fuscous spot at apex ; scutellum with two large black areas ; antennal segment II largely fuscous, at least $4\frac{1}{2}$ times as long as segment I ; tarsal claws non-toothed. (Nigeria) ***O. camerunensis*** Schumacher
5. Hemelytral membrane with black apex ; antennal segments II, III, and IV equally thick. Antennal segment II yellow or orange. Tarsal claws with a large tooth. (Ghana, Togo, Uganda) ***O. apicalis*** Reuter & Poppius
- Membrane uniformly yellowish ; antennal segment IV thicker than segment II or IV 6
6. Antennal segment II largely fuscous, sub-erect bristles on the segment brownish ; tarsal claws non-toothed. (Spanish Guinea, Kenya, Uganda) ***O. unicolor*** Poppius
- Antennal segment II uniformly pale, including its pubescence ; tarsal claws with a moderately prominent tooth. (Tanganyika, Uganda, Sesse Is. on L. Victoria) ***O. similis*** Poppius

The re-descriptions of five species are provided in the following pages.

***Odoniella apicalis* Reuter & Poppius**

(Text-figs. 133–135 and 144)

1911. *Odoniella apicalis* Reuter & Poppius, *Trans. R. ent. Soc. Lond.* **1911** : 412 ; pl. 32, fig. 4.

MALE. Structure. Head across eyes more than twice as wide as it is long in the middle (41 : 18) ; vertex about $2\frac{1}{2}$ times as wide as an eye (47 : 17), and with a fine, nearly obsolete, longitudinal sulcus in the middle. Relative lengths of antennal segments, 15 : 71 : 47 : 33 ; segments II, III, and IV equally thick, segment I thicker. Pronotum across humeral angles about twice as wide as long in the middle (103 : 52), and about four times as wide as across pronotal collar (103 : 26). Membranal cell not surpassing apex of cuneus ; cell with rounded apex. Tarsal claws with a large tooth (Text-fig. 144). Genitalia illustrated in Text-figs. 133–135. Length of body 8.35 mm., width across humeral angles 3.69 mm.

Colour. General colour red or orange. Antennal segments I and II reddish-yellow, segments III and IV black ; pubescence on antennae concolorous, sub-erect bristles on segment II yellowish-brown. Anal ridge of hemelytra black ; membrane yellow.

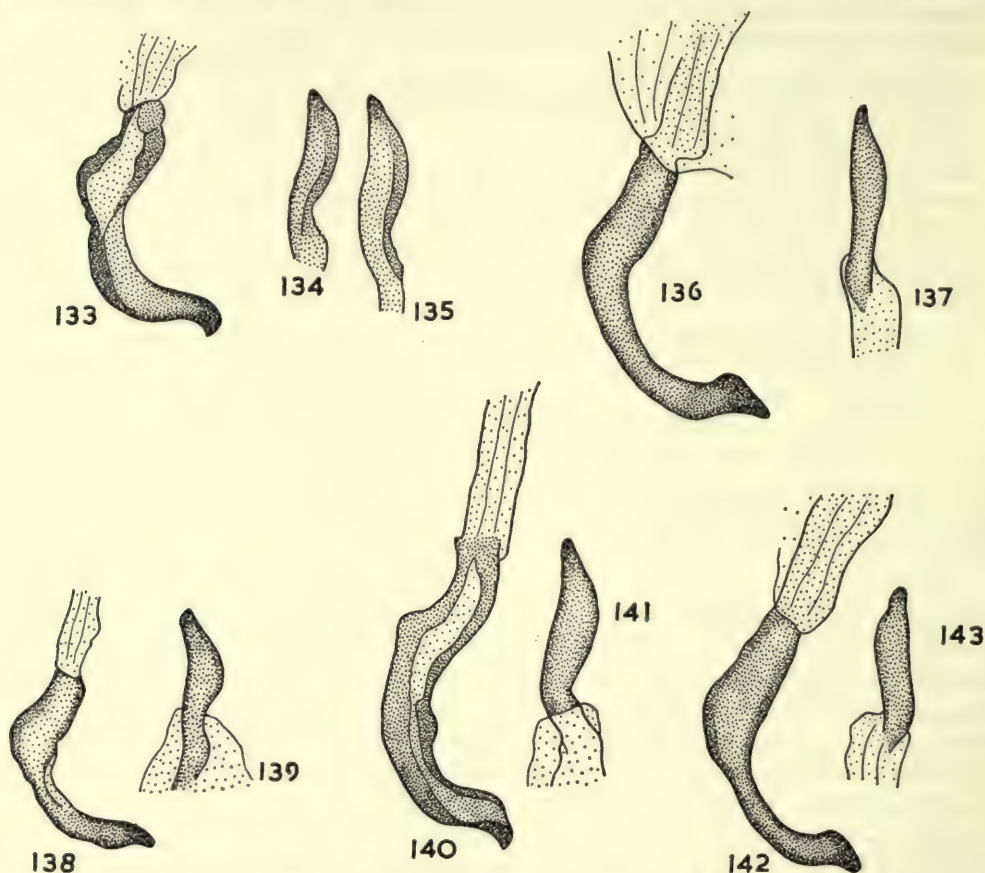
FEMALE. Structure. Head nearly $2\frac{1}{2}$ times as wide as long (44 : 18) ; vertex nearly three times as wide as an eye (51 : 18). Relative lengths of antennal segments, 15 : 60 : 48 : 35. Relative proportions of width of pronotum across humeral angles, median length of pronotum, and width across anterior collar, 110 : 57 : 34. Length of body 10.6 mm., width across humeral angles 4.05 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

MATERIAL EXAMINED (in the Coryndon Museum, Kenya). EAST AFRICA : Uganda, Bwamba Forest, 1 ♂, v. 1952 (E. Pinhey). Material examined in B.M. EAST AFRICA : Uganda, Toro, Daro or Durro Forest, 4,000–4,500 ft., 2 ♂, 25–29.x.1911 (S. A. Neave) ; Bwamba Forest, Semliki Valley, 2,500–2,800 ft., 1 ♀, 3–7.xi.1911 (S. A. Neave) ; Kampala, 1 ♂, 24.xi.1938 ; 2 ♂, 1 ♀ on *Piper*, 14.vii.1939 (all H.

Hargreaves). Kawanda, 1 ♂, 17.ix.1939; 1 ♀, 9.xi.1939 (both H. Hargreaves). WEST AFRICA: Ghana, nr. Tafo, 1 ♀ on *Piper guineense*, i.1943 (H. E. Box).

The toothed tarsal claw immediately distinguishes this species from the rest of the genus, except *O. similis* and *O. rubra*.



FIGS. 133-143. Male genitalia in the genus *Odoniella* Haglund. 133-135: *O. apicalis* Reuter & Poppius. 133, left paramere; 134 and 135, right paramere. 136 and 137: *O. unicolor* Poppius. 136, left paramere; 137, right paramere. 138 and 139: *O. rubra* Reuter. 138, left paramere; 139, right paramere. 140 and 141: *O. similis* Poppius. 140, left paramere; 141, right paramere. 142 and 143: *O. cameruensis* Schumacher. 142, left paramere; 143, right paramere.

Odoniella unicolor Poppius

(Text-figs. 136 and 137)

1912. *Odoniella unicolor* Poppius, *Acta Soc. Sci. fenn.* **41** (3): 187.

The female is described for the first time.

MALE. *Structure*. Head across eyes about twice as wide as long in the middle (41:21); vertex three times as wide as an eye (24:3), and with the median longi-

tudinal sulcus nearly obsolete. Relative lengths of antennal segments, 14 : 72 : 50 : 34; segment IV distinctly thicker than segments II and III, and about as thick as segment I. Pronotum across humeral angles less than twice as wide as long in the middle (99 : 25). Membranal cell surpasses apex of cuneus ; cell with acute apex. Genitalia illustrated in Text-figs. 136 and 137. Length of body 9.95 mm., width across humeral angles 3.42 mm.

Colour. General colour red or orange. Antennal segment I orange ; segment II fuscous, base and apex orange ; segments III and IV black ; sub-erect bristles on segment II brownish. Anal ridge of hemelytra black ; membrane yellowish.

FEMALE. Structure. Head slightly wider than in the male (43 : 21) ; vertex nearly three times as wide as an eye (25 : 9). (Antennae missing.) Relative dimensions of width of pronotum across humeral angles, median length of pronotum, and width across anterior collar, 104 : 54 : 26. Length of body 12.35 mm., width across humeral angles 3.78 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

MATERIAL EXAMINED (in the Coryndon Museum, Kenya). EAST AFRICA : Kenya, Kaimosi, 1 ♂, v. 1952 (E. Pinhey) ; Kakamega, Yala River, 1 ♀ (H. J. A. Turner). Uganda, Kalinzu Forest, 1 ♂, x. 1948 (T. H. E. Jackson) ; Entebbe, 1 ♂, vi. 1957 (R. Carcasson). Material examined in B.M. EAST AFRICA : Kenya, Kome (on L. Victoria), 1 ♂, 13. xii. 1918 ; Kome Forest, 1 ♂, 14. xii. 1918 (both G. D. H. Carpenter). Uganda, SE. Buddu, Toro Forest, 3,800 ft., 1 ♂, 26-30. ix. 1911 (S. A. Neave) ; Bunyoro, Budongo Forest, 3,400 ft., 1 ♂, 11-15. xii. 1911 (S. A. Neave) ; North of L. Isolt, 3,700 ft., 1 ♂, 4-6. i. 1912 (S. A. Neave) ; Mabira Forest, 1 ♂, 27. ix. 1913 (C. C. Gowdey) ; Buunga, 2 ♂, 21. viii. 1933 (H. Hargreaves) ; Entebbe, lake-side, 1 ♀, 6. v. 1957 (T. R. Odhiambo). Two specimens returned to Kawanda Research Station.

Apart from the non-toothed tarsal claws and the structure of the male genitalia, *O. unicolor* may be easily distinguished from *O. apicalis* by the dark antennal segment II, by the thick antennal segment IV, and by the unicolorous hemelytral membrane. In Poppius' original description, antennal segment II is stated to be only four times as long as segment I ; in the present study it has been found to be five times as long.

Odoniella rubra Reuter

(Text-figs. 138, 139 and 145)

1905. *Odoniella rubra* Reuter, *Öfvers. finska Vetensk Soc. Förh.* **47** (10) : 2.

1912. *Odoniella rubra* Reuter ; Poppius, *Acta Soc. Sci. fenn.* **41** (3) : 187.

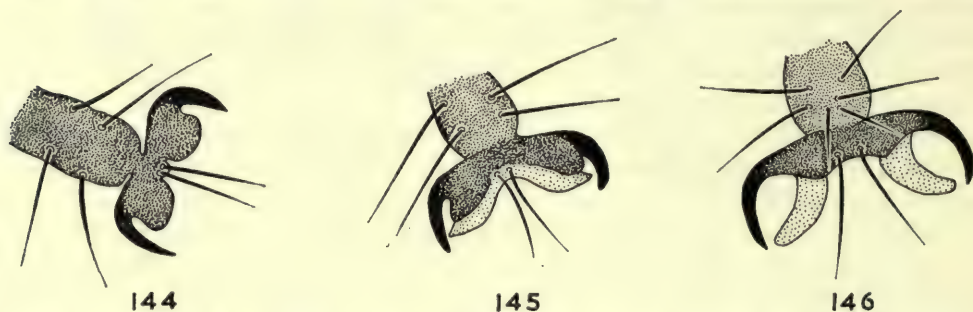
The male is described for the first time.

MALE. Structure. Head across eyes nearly twice as wide as long in the middle (42 : 22) ; vertex three times as wide as an eye (47 : 16), and non-sulcate. Rostrum extending beyond apices of fore coxae. Relative lengths of antennal segments, 14 : 57 : 43 : 32 ; segments III and IV about equally thick, segment II slightly thinner, segment I slightly thicker. Pronotum nearly twice as wide across humeral angles as it is long in the middle (90 : 46), and less than four times as wide as across pronotal collar (90 : 25). Tarsal claws with a somewhat prominent basal tooth

(Text-fig. 145). Genitalia illustrated in Text-figs. 138 and 139. Length of body 7.2 mm., width across humeral angles 3.19 mm.

Colour. General colour orange to red, sometimes more yellowish. Antennal segments I and II orange, segments III and IV black; sub-erect bristles on segment II yellowish-brown. Apical half of corium (excluding embolium) and anal ridge black; membrane yellowish, apex broadly fuscous, vein sometimes suffused with red.

FEMALE. Structure. Head nearly twice as wide as long (44 : 23); vertex almost three times as wide as an eye (51 : 18). Relative lengths of antennal segments, 15 : 64 : 46 : 33; segment IV about as thick as segment I. Relative proportions of width of pronotum across humeral angles, median length of pronotum, and width



FIGS. 144-146. Tarsal claws in *Odoniella* Haglund. 144, *O. apicalis* Reuter & Poppius; 145, *O. rubra* Reuter; 146, *O. similis* Poppius.

across anterior collar, 110 : 55 : 28. Length of body 9.2 mm., width across humeral angles 3.96 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male, except: corium in Cameroons specimens extensively black.

MATERIAL EXAMINED. WEST AFRICA: Ghana, nr. Tafo, 2 ♂, 1 ♀ on *Piper guineense*, i. 1943 (H. E. Box). Pamen, E. P., 1 ♀ feeding on leaves of twiner in swollen-shoot patch, ix. 1942 (G. S. Cotterell). British Cameroons, L. Barombi, 800 ft., 1 ♀ on *P. guineense*, 20. i. 1944 (H. E. Box). All in B.M.

Odoniella similis Poppius

(Text-figs. 140, 141 and 146)

1914. *Odoniella similis* Poppius, *Acta Soc. Sci. fenn.* 44 (3) : 129.

The female is described for the first time.

MALE. Structure. Head across eyes twice as wide as long in the middle (41 : 21); vertex nearly three times as wide as an eye (48 : 17), and with the median longitudinal sulcus obsolete or very nearly so. Rostrum extending a little beyond apices of fore coxae. Relative lengths on antennal segments, 15 : 74 : 52 : 35; segment IV distinctly thicker than segments II and III, and about as thick as segment I. Pronotum across humeral angles nearly twice as wide as it is long in the middle (98 : 52), and nearly

four times as wide as across anterior collar (98 : 25). Genitalia illustrated in Text-figs. 140 and 141. Length of body 9.4 mm., width across humeral angles 3.60 mm.

Colour. General colour red or orange. Antennal segments I and II orange ; pubescence on segment II concolorous, sometimes sub-erect bristles towards apex somewhat yellowish-brown. Anal ridge of hemelytra black ; membrane yellowish.

FEMALE. Structure. Head across eyes more than twice as wide as median length (44 : 19) ; vertex almost three times as wide as an eye (51 : 18). Relative lengths of antennal segments, 15 : 66 : 47 : 33 ; segment IV only slightly thicker than segments II and III. Relative dimensions of width across humeral angles, median length of pronotum, and width across anterior collar, 117 : 62 : 28. Length of body 10.25 mm., width across humeral angles 4.25 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

MATERIAL EXAMINED. EAST AFRICA : Uganda, West shores of Victoria Nyanza, Buddu, 3,700 ft., 1 ♀, 19-25.ix.1911 (S. A. Neave). Entebbe, 1 ♂, 16.xii.1912 (C. C. Gowdey). Sesse Isles, 1 ♂, 3.iv.1925 (G. D. H. Carpenter). Kampala, 2 ♀ on *Smilax*, 24.xi.1938 (H. Hargreaves). Kawanda, 1 ♀, 27.x.1939 (H. Hargreaves). One specimen returned to Kawanda Research Station ; all others in B.M.

Odoniella camerunensis Schumacher

(Text-figs. 142 and 143)

1917. *Odoniella camerunensis* Schumacher, *S. B. Ges. naturf. Fr. Berlin*, 1917 : 451.

The male is described for the first time.

MALE. Structure. Head across eyes almost twice as wide as median length (38 : 20) ; vertex nearly three times as wide as an eye (21 : 8), and with the median longitudinal sulcus indistinct. Relative lengths of antennal segments, 14 : 64 : 47 : 32 ; segment IV distinctly thicker than segments II and III, segment I slightly thicker than IV. Pronotum across humeral angles almost twice as wide as it is long in the middle (89 : 46), and nearly four times as wide as across anterior collar (89 : 23). Genitalia illustrated in Text-figs. 142 and 143. Length of body 7.45 mm., width across humeral angles 3.20 mm.

Colour. General colour orange. Antennal segment I orange ; segment II fuscous to black, base and apex yellowish or orange ; segments III and IV black. A large spot on either half of scutellum black. Anal ridge of hemelytra black ; membrane yellowish, apex with a fuscous spot, vein orange.

FEMALE. Not examined.

MATERIAL EXAMINED. WEST AFRICA : Nigeria, Ijebu Igbo, 1 ♂ on *Culcasia parrifolia* in secondary forest, 23.xii.1943 (H. E. Box). In B.M.

PSEUDODONIELLA China & Carvalho

1951. *Pseudodoniella* China & Carvalho, *Bull. ent. Res.* 42 (2) : 465.

1951. *Parabryocoropsis* China & Carvalho, *Bull. ent. Res.* 42 (2) : 468 (syn. n.).

Type-species : *Pseudodoniella pacifica* China & Carvalho.

From the original descriptions of the two genera, *Parabryocoropsis* China & Carvalho

may be distinguished from *Pseudodoniella* China & Carvalho as follows: (1) by the stout body (in *Pseudodoniella* the body is relatively elongate); (2) by the frontal tubercle having two lateral blunt protuberances forming a V-shape (in *Pseudodoniella* the frontal tubercle is less acutely pointed); (3) by the smooth, shiny, irregular, tubercular swellings on the pronotum and scutellum; and (4) by the exposed abdominal connexiva (in *Pseudodoniella* they are partially covered).

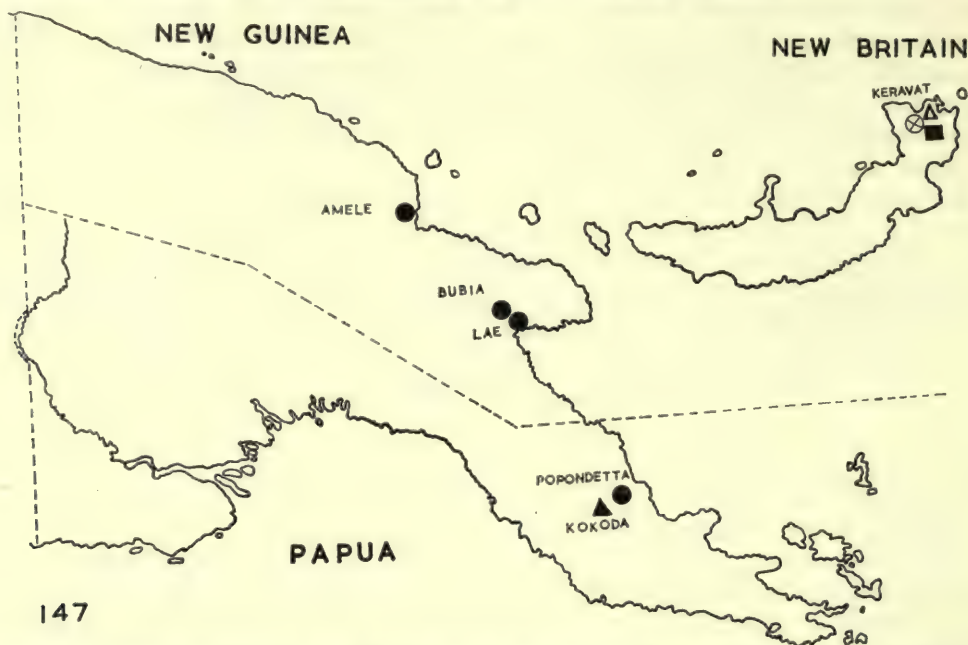


FIG. 147. Distribution of species of *Pseudodoniella* China & Carvalho. Key to signs:

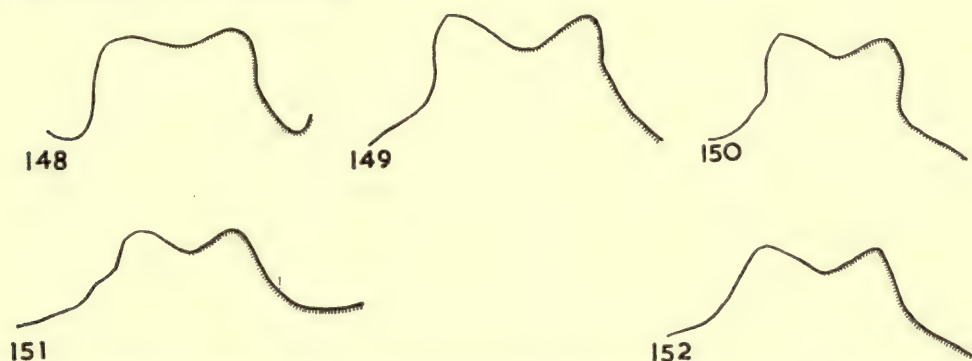
- △ *P. pacifica* China & Carvalho
- ▲ *P. cheesmanae* (China & Carvalho)
- *P. laensis* Miller
- ⊗ *P. typicus* (China & Carvalho)
- *P. duni* (China & Carvalho)

On the other hand: (1) *Parabryocoropsis duni* is intermediate in shape between the typical species of the two genera; (2) a series in the shape of the frontal tubercle is discernible amongst the species of the two genera, viz. *Pseudodoniella pacifica*—*Pseudodoniella laensis*—*Parabryocoropsis typicus*; (3) *P. pacifica* has more or less distinct, smooth, shiny, tubercular swellings, particularly on the scutellum; and (4) the abdominal connexiva are exposed in both *P. duni* and *P. laensis*.

In his 1957 paper, Miller transferred *cheesmanae* and *duni* from the genus *Parabryocoropsis* to *Pseudodoniella*, and he also described two new species of *Pseudodoniella*—*laensis* and *szentivanyi*. Miller used the following characters to separate the two genera: in *Parabryocoropsis* (1) the body is less elongate, being only twice as long as wide; (2) the scutellum is much shorter than broad, and not visibly emarginate at apex; (3) the antennae are shorter and thicker; (4) the cuneus is much shorter; (5) the

hind tibiae are straight, thicker, and feebly nodular (in *Pseudodoniella* they are distinctly curved and minutely tuberculate); and (6) the abdominal connexiva are not covered by hemelytra. None of these differences is convincing as a diagnostic character, as there are intermediates (in characters 1, 4, and 6 above), or they are no more than specific characters (characters 2, 3, and 5).

In view of the difficulty of distinguishing the two genera from each other, therefore, and since the genitalic structures show no distinct differences either, it is concluded that only one genus is represented here. It is proposed to regard *Parabryocoropsis* as a synonym of *Pseudodoniella*.



FIGS. 148-152. Shape of frons in *Pseudodoniella* as viewed from above. 148, *P. pacifica* China & Carvalho; 149, *P. duni* (China & Carvalho); 150, *P. typicus* (China & Carvalho); 151, *P. cheesmanae* (China & Carvalho); 152, *P. laensis* Miller.

A new key has been constructed to facilitate identification since Miller's (1957) key is difficult to use, and because his species *szentivanyi* has been synonymized with *laensis* Miller (see below).

KEY TO SPECIES OF *Pseudodoniella*

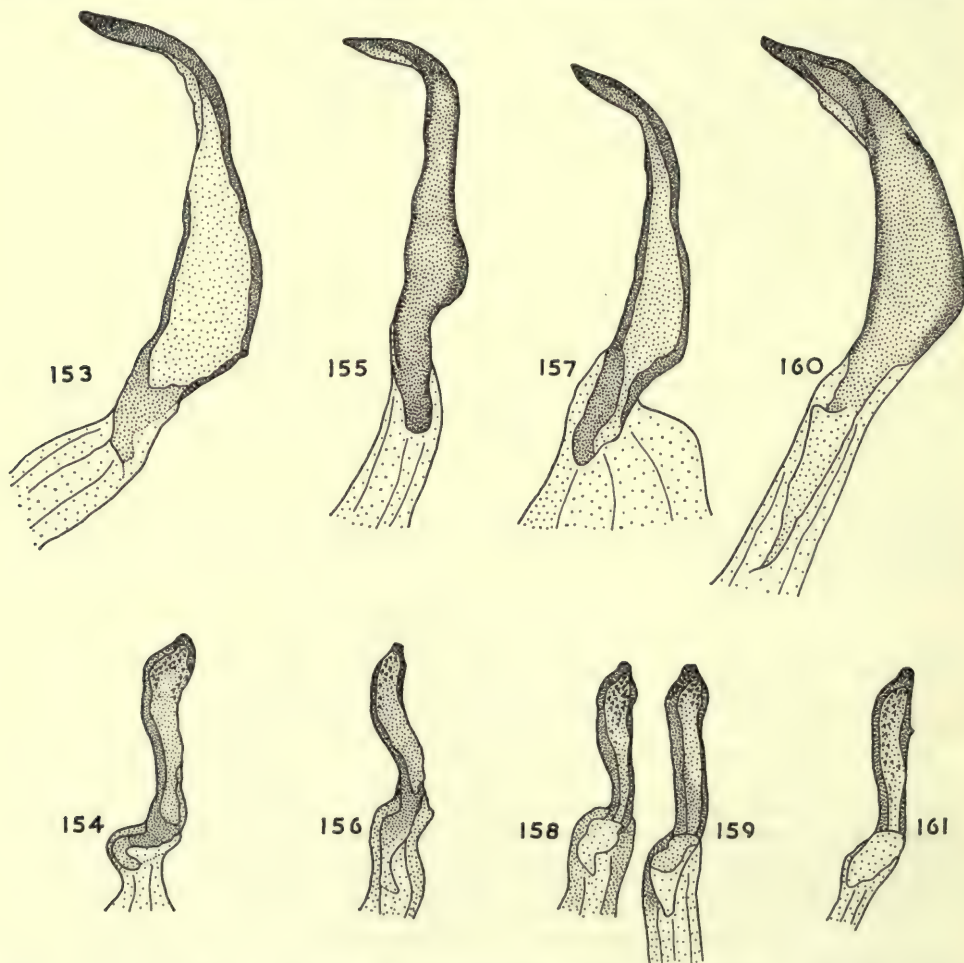
1. Pronotum with distinct, smooth, shiny, tubercular swellings; the two protuberances on the frontal tubercle very prominent and V-shaped (Text-figs. 149-152) 2
- Pronotum without distinct tubercular swellings; the two protuberances on the frontal tubercle very short and widely separated (Text-fig. 148). (New Britain)
P. pacifica China & Carvalho
2. Scutellum in profile appears abruptly rounded to apex; antennal segment II five times as long as segment I, apical one-sixth clubbed, and here nearly twice as thick as at base; antennal segment III with three prominent swellings; robust species 3
- Scutellum in profile appears gently rounded to apex; antennal segment II about six times as long as segment I, apical one-sixth not clubbed, and here only $1\frac{1}{2}$ times as thick as at base; antennal segment III only indistinctly, irregularly swollen; more slender species 4
3. Dorsum largely reddish. (New Britain) *P. duni* (China & Carvalho)
- Dorsum largely dark. (New Britain) *P. typicus* (China & Carvalho)
4. Apex of scutellum as seen from above somewhat emarginate
P. cheesmanae (China & Carvalho)
- Apex of scutellum as seen from above truncate. (Papua and New Guinea)
P. laensis Miller

Pseudodoniella laensis Miller

(Text-figs. 147, 152, 157-159)

1957. *Pseudodoniella laensis* Miller, *Bull. ent. Res.* **48** (1) : 57, figs.1957. *Pseudodoniella szentivanyi* Miller, *Bull. ent. Res.* **48** (1) : 57, fig.1960. *Pseudodoniella laensis* Miller; Odhiambo, *Bull. ent. Res.* **51** : 519-521 figs.

In a recent paper the author (Odhiambo, 1960) has stated reasons why he synonymized Miller's two species, *P. laensis* and *P. szentivanyi*. Briefly, Miller based his



FIGS. 153-161. Male genitalia of *Pseudodoniella* China & Carvalho. 153 and 154: *P. pacifica* China & Carvalho. 153, left paramere; 154, right paramere. 155 and 156: *P. typicus* (China & Carvalho). 155, left paramere; 156, right paramere; 157-159: *P. laensis* Miller. 157, left paramere; 158 and 159, right paramere at slightly different angles. 160 and 161: *P. cheesmanae* (China & Carvalho). 160, left paramere; 161, right paramere.

descriptions very largely on colour, and even in this case there is great variation and overlap in the colour of the two nominal species ; furthermore, no consistent difference could be detected in either external structure or the structure of male genitalia (although in the case of genitalia of the genus as a whole only *P. cheesmanae* shows obvious structural differences, cf. Text-figs. 153–161). *P. laensis* takes page priority over *P. szentivanyi*.

YANGAMBIA Schouteden

1942. *Yangambia* Schouteden, *Rev. Zool. Bot. afr.* **35** (1) : 5.

1944. *Idioapsis* China, *Bull. ent. Res.* **35** (2) : 186.

Schouteden (1942 : 5) erected *Yangambia* to receive a peculiar new species from the Congo somewhat similar to *Sahlbergella* species, but having processes on the pronotal collar. At almost the same period, China (1944 : 186–188) named a new, species from West Africa for which he erected a new genus, *Idioapsis*, and which also showed these same peculiar pronotal processes. Schouteden later came to the conclusion that the two genera were identical (Schouteden, 1945 : 116). In addition, he synonymized the two species concerned.

Type material of both species has been examined in the course of the present studies. Schouteden is undoubtedly correct in synonymizing the two genera ; but there is no supporting evidence for sinking China's species as well. The latter species is, therefore, being resurrected from synonymy. The two species of *Yangambia* may be separated as follows :

Y. vesiculata Schouteden

1. Bristles on antennal segment II sparse
2. Posterior lateral angles of pronotum with five large serrations and two minute ones (Text-fig. 165)
3. Apex of scutellum blunt and spatulate (Text-fig. 163)
4. Scutellum with basal lobe more or less smooth, with only slight swellings or depressions
5. Pronotum and scutellum pale in colour

Y. macarangae (China) **comb. n.**

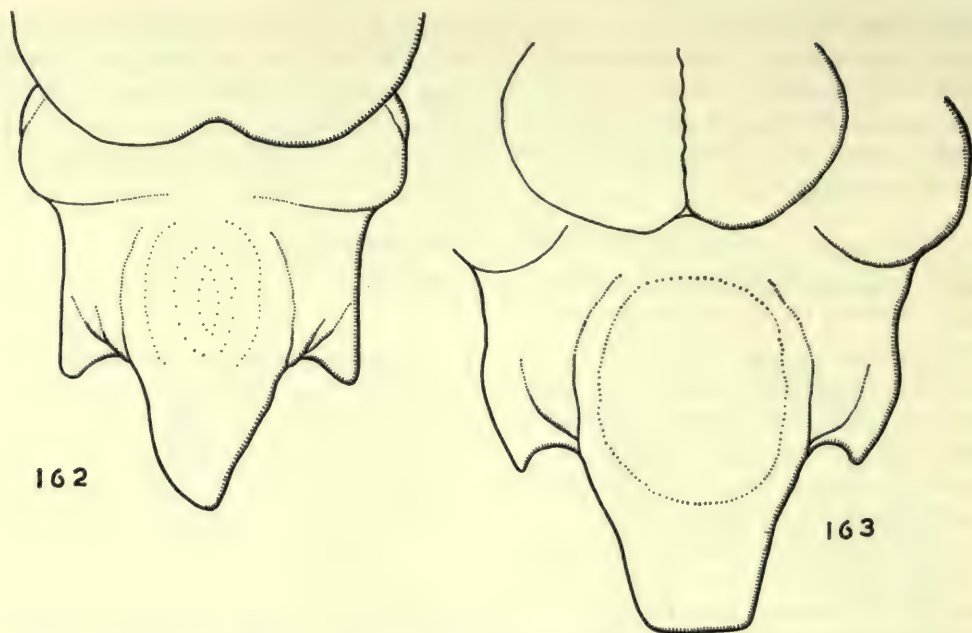
- . Dense.
- . With only five serrations (Text-fig. 164).
- . Apex of scutellum pointed (Text-fig. 162).
- . Scutellum with distinct swellings.
- . Pronotal collar, posterior lobe of pronotum, and basal lobe of scutellum, largely dark.

VOLKELIUS Distant

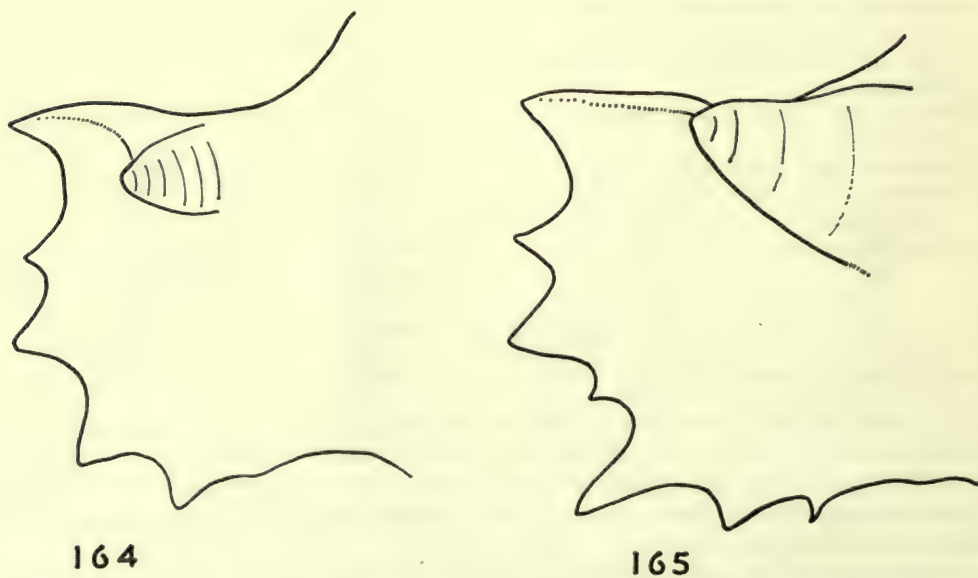
1904. *Volkelius* Distant, *Ann. Mag. nat. Hist.* (7) **13** : 271.

As Distant's (1904) description is rather inadequate a fuller one is provided below. It should also be noted that the single known species of the genus is confined to Australia, and does not appear to have been recorded elsewhere. *Volkelius* and *Pseudodoniella* are the only genera of the *Bryocoropsis-Sahlbergella*-complex found outside the Ethiopian Region.

A second (new) species is represented by a single specimen in the British Museum (Nat. Hist.) (data : Tooloom, N.S.W., Jan., 1926, H. Hacker) ; but it has lost its abdomen, so it has been thought best to leave it undescribed for the time being.



FIGS. 162 and 163. Shape of apex of scutellum from above in *Yangambia* Schouteden. 162, *Y. macarangae* China; 163, *Y. vesiculata* Schouteden.



FIGS. 164 and 165. Serration on left posterior lateral angle of pronotum in *Yangambia* Schouteden. 164, *Y. macarangae* China; 165, *Y. vesiculata* Schouteden.

RE-DESCRIPTION. Body shiny. Head short and very transverse ; vertical, nearly half as high as it is broad ; viewed from above appears half as long as broad, from the side appears a little shorter than high ; covered with sparse bristles. Vertex with a median longitudinal sulcus, dividing two oval callus-like areas delimited by raised edges ; the rest of the head smooth and shiny. Frons swollen, blunt. Anteclypeus inflated, separated from frons by a transverse depression, anterior edge as seen in profile sinuate in the middle. Eyes prominent, sub-stylate, located near anterior lateral margins of head ; from the side eyes appear to occupy only half height of head, from in front inner margins appear somewhat concave. Rostrum extends to apices of fore coxae ; segment I reaching base of head. Antennae inserted near lower margin of eyes ; segment I very thick, more than half as thick as it is long, extreme base slender, thickest near base, about one-third as long as head is wide and slightly more than half as long as width of vertex, segment covered with somewhat scattered erect bristles arising from minute swellings ; segment II about as long as head and pronotum together, more slender than segment I, about apical quarter clavate, densely covered with sub-erect and some erect bristles, the latter longer than the thickness of the thinnest part of the segment, base of segment somewhat thickened ; segment III about as long as pronotum, incrassate towards apex, and here distinctly thicker than segment II, and about as thick as segment I ; segment IV fusiform, greatly thickened, thicker than segment I ; bases of segment III and IV thin ; segments III and IV densely covered with short adpressed hairs and some moderately long sub-erect or erect bristles, such hairs also present on apical half of segment II. Pronotum convex, deflected anteriorly, disc (except calli) rugosely punctate, disc (including calli) covered with erect moderately long hairs, densely so near the margins, posterior margin sinuate ; collar extending posteriorly in a triangular area between the calli ; calli smooth, very shiny, reaching lateral margins of pronotum ; fore acetabula visible from above. Scutellum triangulate, slightly shorter than broad, convex, not distinctly higher than pronotum at base, with a median longitudinal sulcus ; disc rough, covered with numerous small swellings, densely covered also with erect hairs. Hemelytra densely pubescent ; cuneus longer than broad ; membrane with a very dense pale covering of minute scale-like pubescence. Abdominal connexiva only partially exposed. Legs shaggy, densely covered with bristles, particularly tibiae, the bristles arise out of small swellings ; femora somewhat thickened at apex ; tibiae thick, equally so throughout their length ; tarsi not markedly swollen apically, first and third segments subequal in length, second segment a little shorter ; tarsal claws with a moderately large tooth. Type-species : *Volkelius sulcatus* Distant.

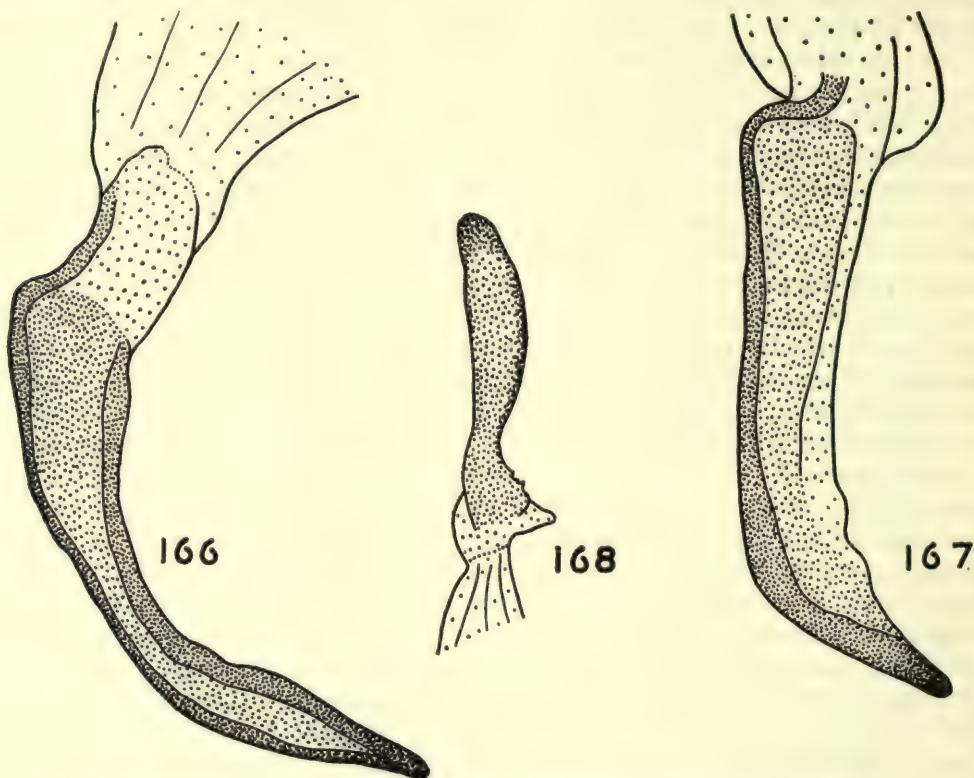
Volkelius sulcatus Distant

(Text-figs. 166-168)

1904. *Volkelius sulcatus* Distant, *Ann. Mag. nat. Hist.* (7) 13 : 271.

MALE. *Structure.* Head across eyes about $2\frac{1}{2}$ times as broad as median length (42 : 16) ; vertex about $2\frac{1}{2}$ times as wide as an eye (23 : 9). Relative lengths of antennal segments, 16 : 64 : (III and IV missing) ; segment I greatly thickened

(except the narrow base), as thick as hind femur at apex; segment II thickened towards apex, near base only half as thick as segment I, at apex only a little thinner than segment I. Pronotum more than $1\frac{1}{2}$ times as wide across humeral angles as long in the middle (80 : 47), and more than three times as wide as across anterior collar (80 : 25). Hemelytra densely covered with rather short erect hairs. Genitalia illustrated in Text-figs. 166-168. Length of body 7.4 mm., width across humeral angles 2.83 mm.



FIGS 166-168. Male genitalia of *Volkelius sulcatus* Distant. 166, left paramere; 167, the same: internal aspect; 168, right paramere.

Colour. General colour reddish-brown. Pubescence yellowish-brown, except hairs on antennae and dark areas on hemelytra which are fuscous to black. Antennae fuscous to black, base of segment I narrowly reddish-brown. Scutellum fuscous to brown, extreme apex reddish-brown. Exocorium, apex of endocorium, anal ridge, inner basal angles of cuneus, and inner lateral margin (excluding apex) of the latter narrowly, fuscous to black; membrane smoky black. Coxae, trochanters, and bases of femora, reddish-brown, sometimes more extensively so on femora; the rest of femora, bases of fore and middle tibiae broadly, and hind tibiae entirely, black; tibiae and tarsi yellowish-brown, apices of tibiae and tarsi sometimes brownish.

FEMALE. Structure. Head more than twice as broad as long (45 : 20) ; vertex nearly three times as wide as an eye (26 : 9). Relative lengths of antennal segments, 14 : 65 : 44 : 37. Relative proportions of pronotum as to width across humeral angles, median length, and width across anterior collar, 90 : 51 : 28. Length of body 8.55 mm., width across humeral angles 3.24 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

MATERIAL EXAMINED. AUSTRALIA : Queensland, Townsville, 1 ♀ (Holotype), 10.ii.1902 ; 1 ♂, 1 ♀, 17.ii.1903 (all F. P. Dodd). In B.M.

VILLIERSICORIS Delattre

1950. *Villiersicoris* Delattre, *Bull. Mus. Hist. nat. Paris* (2) **22** (2) : 263.

Delattre has enumerated the differences between his genus and *Sahlbergella*, *Boxia*, and *Odoniella*.

The present studies show that *Villiersicoris* is closely allied to *Volkelius*, and may later prove to be congeneric with it. At the moment, however, this question is not being finally settled since the male genitalia have not been examined in *Villiersicoris* (the two species are only known from the female). The most distinctive feature of *Villiersicoris* is the presence of large pronotal calli which project beyond the lateral margins of the pronotum. Although they are not found in *Volkelius* in this exaggerated condition, nevertheless the calli are large and reach the lateral margins of the pronotum. The second notable feature of *Villiersicoris* is the clavate apical portions of the second antennal segment and hind femora. In *Volkelius* the beginnings of this are seen. The relative lengths of the rostrum, which have been used to separate the two genera, is not a good character. The best diagnostic character seems to lie in the presence of a row of coarse punctures along the claval sutures which is found in *Villiersicoris* but not in *Volkelius* or, apparently, in the other genera of the *Bryocoropsis-Sahlbergella*-complex.

Villiersicoris sessensis sp. n.

(Text-fig. 169)

FEMALE. Structure. Head across eyes nearly three times as broad as median length (34 : 12), and extending well beyond anterior lateral angles of pronotum ; long erect bristles on anteclypeus, frons, and either side of vertex ; vertex about $3\frac{1}{2}$ times as wide as an eye (22 : 6), with a median longitudinal sulcus ; callus-like areas on vertex obscure, delimited merely by indistinct round ridges round the smooth areas. Eyes sub-pedunculate, in profile appear to occupy only half height of head. Relative lengths of antennal segments 11 : 43 : 27 : 26 ; segment I inflated, as long as pronotal callus is wide, base very thin, segment covered with erect bristles, the latter shorter than those on the head ; segment II with about apical two-fifths clavate, and here about as thick as segment I, and about three times as thick as at base ; segments III and IV fusiform, greatly thickened, four times as thick as segment II at base, and about as thick as hind femur at apex ; basal thin portion of segment II with sub-erect bristles, apical portion of the segment and segments III and IV wholly densely

covered with adpressed hairs and isolated short bristles. Rostrum reaching nearly to bases of middle coxae. Pronotum rugosely punctate, calli smooth, collar with small swellings bearing long erect bristles, long erect bristles also on lateral margins of calli and along margins of pronotum; disc across humeral angles more than $1\frac{1}{2}$

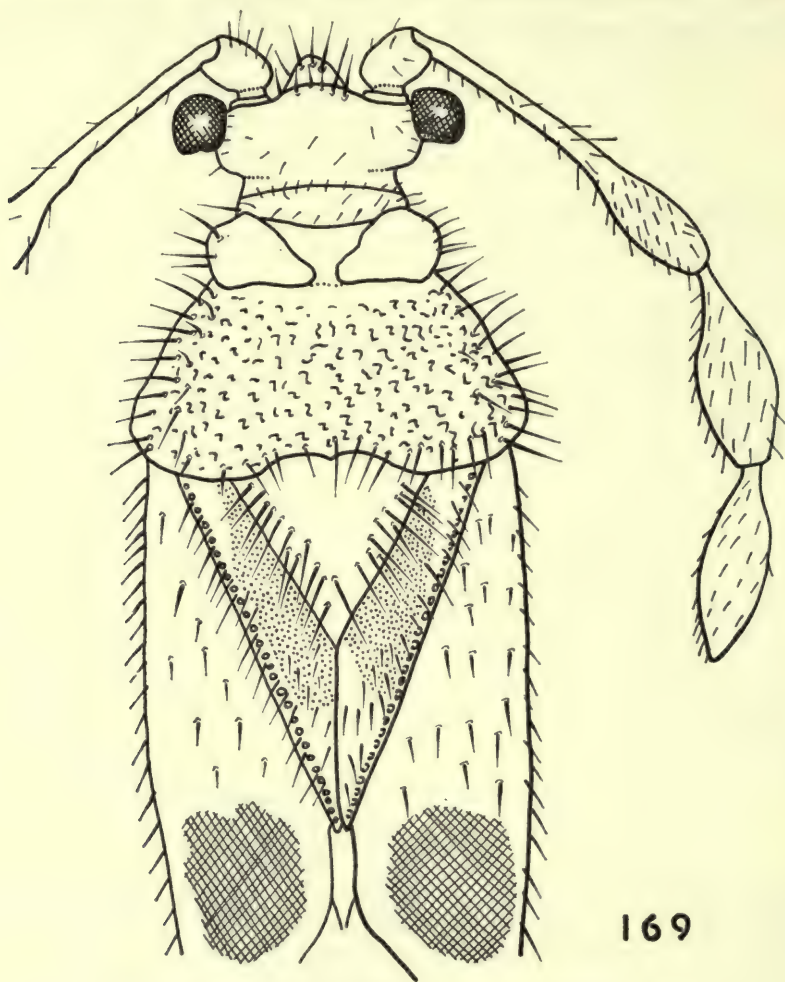


FIG. 169. Dorsum of *Villiersicoris sessensis* sp. n.

times as broad as it is long (49 : 30), and nearly three times as broad as across anterior collar (49 : 17); calli large, convex, prominent, extending to lateral margins of pronotum and projecting beyond; posterior margin of pronotum sinuate and concave in the middle. Scutellum finely rugosely punctate, moderately densely covered with long erect bristles near margins. Hemelytra covered with setigerous swellings, clavus and cuneus smooth, claval suture with a row of coarse punctures; membrane with a dense covering of minute, pale, scale-like pubescence. Fore femora narrowing

towards apices, hind femora distinctly thickened towards apices; legs densely covered with long, erect or sub-erect bristles. Abdomen with long setae. Length of body 7.8 mm., width across humeral angles 2.61 mm.

Colour. Body shiny. Head reddish-brown. Antennal segment I reddish-brown, the narrow base yellowish, towards apex somewhat fuscous; segment II fuscous to black, base narrowly and the swollen apical portion largely reddish-brown; segment III dark reddish-brown, almost black; segment IV black, with a reddish tinge. Pronotum and scutellum yellowish-brown. Hemelytra yellowish-brown; middle portion of clavus, base of corium obscurely, and cuneus, reddish-brown; apical one-quarter of corium fuscous; membrane smoky black, vein reddish-brown. Abdomen red, thoracic venter somewhat darker. Legs brownish-red; apical one-quarter to one-third of femora with fuscous markings; tibiae yellowish-brown, a band near base and apex brownish to fuscous. Pubescence pale in colour, a few fuscous ones on dark parts of antennal segment II, femora, and tibiae.

MALE. Unknown.

Holotype ♀. EAST AFRICA: Sesse Isles (on L. Victoria), iv. 1925 (C. D. H. Carpenter). In B.M.

Apart from the relatively shorter rostrum in *V. sessensis*, the new species may be distinguished from *V. holasi* Delattre (the type and only other species) as follows:

<i>V. holasi</i>	<i>V. sessensis</i>
1. Antennal segment II fuscous	. Segment fuscous, the apical swollen part reddish-brown.
2. Pronotum yellowish-brown, collar and calli reddish-brown	. Uniformly yellowish-brown.
3. Femora black	. The larger (basal) portion brownish-red.
4. Hind tibiae black, except narrowly at base	. Pale yellowish-brown, except for a dark band near base and another near apex.
5. Pubescence on femora and tibiae (only partly) black	. Mostly pale in colour.

Tribe MONALONIINI

EUCEROCORIS Westwood

1837. *Eucerochoris* Westwood, *Trans. R. ent. Soc. Lond.* 2: 21.

Up to the present study, eight species of the genus *Eucerochoris* had been described. Of these, two species (*E. basifer* Walker and *E. braconoides* Walker) and possibly a third species (*E. tumidiceps* Horváth) belong to a distinct genus, as revealed later in this paper. The remaining five species definitely belong to *Eucerochoris*, to which is now being added five new species described in the following pages.

RE-DESCRIPTION. Body long and slender; shiny, polished; dorsum glabrous, except for the minute pubescence along the edge of hemelytral membrane. Head transverse; vertex convex, topmost part somewhat above eyes, with a median longitudinal sulcus; anteclypeus distinctly inflated, clearly marked off from frons, anterior margin as seen in profile straight except at base. Eyes removed from anterior margin of pronotum, viewed from above appear rounded, from the side appear to

occupy more than half height of head. Rostrum extends far beyond apices of fore coxae. Antennae longer than body, inserted very close to eyes; insertion area very large, oval or rounded, at least half as large in diameter as length of inner margin of an eye; segment I shortly bent at base, and here thickened a little, segment club-shaped near apex; segments II to IV slender, linear, about equally thick; antennae covered by three types of hairs: short erect hairs, long erect hairs, and short suberect hairs. Pronotum with a distinctly narrowed anterior lobe; posterior lobe convex, declivous, posterior margin straight; calli obscure or distinct, confluent, somewhat swollen, reaching sides of pronotum; collar thick, thicker than length of a callus; anterior acetabula visible from above. Scutellum almost flattened, nearly equilateral, a little broader than long, apex blunt; mesoscutum a little exposed. Hemelytra somewhat curved inwards laterally in the middle; cuneus very long and narrow; apex of membranal cell sharply angular, extending distinctly beyond apex of cuneus. Legs long and slender; femora incrassate at apices; fore tibiae with a long spur-like projection at one end of tibial comb; tarsal claws strongly curved; femora and abdomen with a few scattered hairs, tibiae and tarsi with short abundant setae. Type-species: *Eucercoris nigriceps* Westwood. (The type is apparently lost; it is not at Oxford. But the original scanty description appears to fit in with the genus as described here.)

The present author recognizes two subgenera within *Eucercoris*, of which one is new. They may be differentiated as follows:

***Eucercoris* s. str.**

Type-species: *E. nigriceps* Westwood

1. Femora linear, at most weakly curved in the middle or curved only at base
2. Male last abdominal segment without a swollen projection
3. Distribution: Australia, New Guinea, Fiji

***Ragwelellus* subgen. n.**

Type-species: *E. peregrinus* sp. n.

- Femora distinctly bow-shaped in the middle.
- Last abdominal segment in male with a swollen projection or a conical swelling with a sharp point.
- Distribution: Solomon Islands.

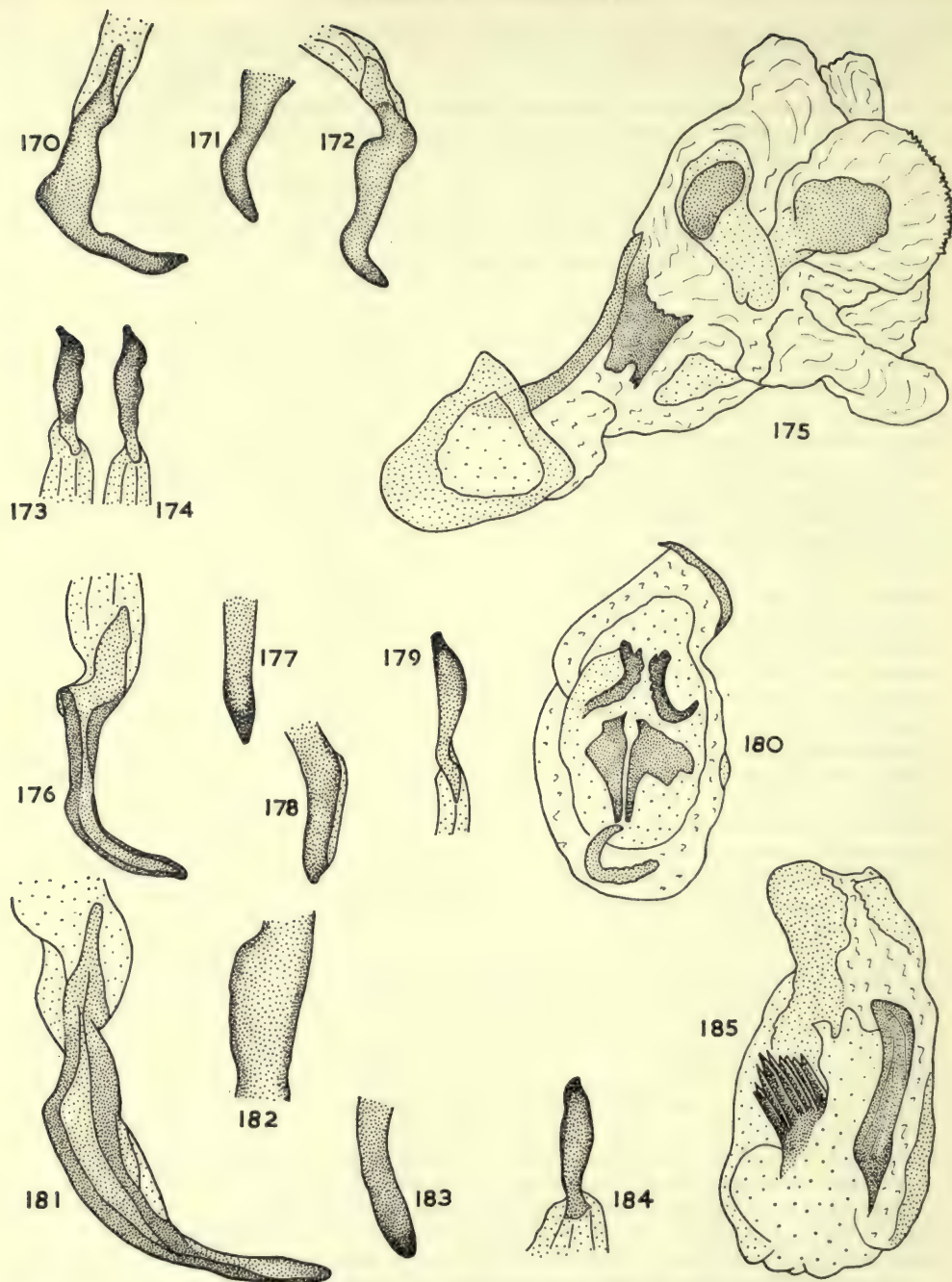
The male genitalia give the best distinguishing characters. The left paramere in the new subgenus has a distinct projection in the middle; the structure of the vesica is different; and the last abdominal segment exhibits a distinct protuberance.

KEY TO SPECIES OF *Eucercoris*¹

1. Femora markedly curved in the middle; length of cubital vein beyond apex of membranal cell at most $1\frac{1}{2}$ times length of distance between apex of cell and apex of membrane; last abdominal segment of male with a projection or cone-like prominence near dorsal lateral margin. Rostrum reaches middle of mesocoxae or beyond (**RAGWELELLUS** subgen. n.) 6
- . Femora at most weakly curved; length of cubital vein beyond apex of membranal cell at least $1\frac{2}{3}$ times length of distance between apex of cell and apex of membrane; last abdominal segment of male without a projection or prominence (subgen. **EUCEROCORIS** Westwood) 2

¹ One species, *tumidiceps* Horváth, is not included in the key since its generic status is in doubt (see also discussion under *Rayieria* gen. n.).

2. Hemelytra black, with only small pale spots at base, membranal vein black; scutellum fuscous; head above antennal insertion black, below testaceous. (Locality unknown) *E. nigriceps* Westwood
- Head with extensive reddish or yellowish markings or entirely testaceous, membranal vein reddish; scutellum testaceous or reddish or fuscous suffused with red; head largely testaceous 3
3. Rostrum extends to middle of mesocoxae; pronotum about as long as broad; dorsum orange to blood red (except membrane). (New Guinea) *E. horvathi* Poppius
- Rostrum at most reaches bases of mesocoxae; pronotum distinctly broader than long; dorsum with extensive dark markings on head and hemelytra and sometimes also on scutellum 4
4. Antennal segments II and III with very long, dense, erect hairs, the latter five times as long as thickness of segment; segment III a little longer than segment I; cubital vein beyond apex of membranal cell more than $2\frac{1}{2}$ times length of the distance between apex of cell and apex of membrane; abdomen yellow, with apical one-third to half black. (Fiji) *E. thetis* Kirkaldy
- Antennal segments II and III with the longest hairs only about $1\frac{1}{2}$ times as long as thickness of segment; segment III shorter than segment I; cubital vein beyond apex of cell not equal in length to more than twice the distance between apex of cell and apex of membrane; abdomen testaceous or yellowish with reddish markings, no darker markings 5
5. Rostrum extends to bases of mesocoxae; antennal segment III much shorter than segment I by about one-third to half; pronotum and scutellum testaceous; corium very dark reddish fuscous, base paler; legs testaceous, femora towards apices and tibiae basally with black markings. (Australia) *E. suspectus* Distant
- Rostrum extends to middle of mesobasisternum; antennal segment III only slightly shorter than segment I; pronotum and scutellum fuscous to black, suffused with red, with a large yellowish area in the middle of pronotum; corium dark red, apical one-third and embolium pale yellow; femora and tibiae pale yellow, apices testaceous. (New Guinea) *E. festivus* Miller
6. Pronotal calli prominent, swollen, about as long as thickness of pronotal collar; rostrum reaches middle of mesocoxae; last abdominal segment in male with a cone-like prominence 7
- Calli almost obsolete, flattened, only about half as long as thickness of collar; rostrum extends to apices of mesocoxae; last abdominal segment in male with a relatively long projection on dorsal lateral margin (male of *E. propinquus* sp. n. unknown) 8
7. Head black; dorsum (except cuneus and membrane) uniformly testaceous; apical halves of femora and bases of tibiae with fuscous markings; venter testaceous. (Bougainville Is.) *E. kietae* sp. n.
- Head testaceous, anteclypeus dark red or fuscous; pronotum entirely testaceous or largely black, scutellum black or testaceous, hemelytra fuscous to black; femora and tibiae testaceous, without dark markings; abdomen with apical half fuscous. (Guadalcanal) *E. pallipes* sp. n.
8. Cubital vein beyond apex of membranal cell two-thirds length of distance between apex of cell and apex of membrane; pronotum orange, except for anterior half of collar and a large band on either side of posterior lobe. (Ysabel) *E. vittatus* sp. n.
- Cubital vein beyond apex of cell at least $1\frac{1}{2}$ times length of distance between apex of cell and apex of membrane; pronotum black, only calli, posterior margin of collar, and sometimes a median band on posterior lobe, testaceous 9
9. Apical three-fifths of femora and basal three-fifths of tibiae black. (Guadalcanal) *E. propinquus* sp. n.
- Apical two-fifths of femora and only extreme bases of tibiae black. (Ysabel, Bougainville Is.) *E. peregrinus* sp. n.



FIGS. 170-185. Male genitalia in the subgenus *Eucerochoris* Westwood. 170-175: *E. thetis* Kirkaldy. 170, left paramere; 171, the same: inner aspect of apex; 172, the same: inner aspect with basal portion flat on slide; 173 and 174, right paramere; 175, everted aedeagus in dorsal view. 176-180: *E. festivus* Miller. 176, left paramere; 177, the same: inner aspect of apex; 178, the same: inner lateral

Eucerochoris (Eucerochoris) thetis Kirkaldy

(Text-figs. 170-175)

1908. *Eucerochoris thetis* Kirkaldy, *Proc. Linn. Soc., N.S.W.* 33 : 376.

MALE. *Structure.* Head across eyes $1\frac{1}{2}$ times as broad as median length (62 : 40), and four-fifths as wide as pronotum at base (62 : 78) ; vertex about twice as broad as an eye (30 : 16). Eyes occupying three-quarters of height of head ; inner margin emarginate. Rostrum extends to bases of middle coxae. Antennal sclerites occupying middle two-thirds of length of inner margin of eyes ; relative lengths of antennal segments, 164 : 306 : 180 : (IV lost) ; segment I with nearly apical one-quarter club-shaped, segment sparsely covered with short erect hairs ; segment II densely covered with long erect hairs, the latter five times as long as thickness of segment, segment with small swellings at bases of hairs, near apex also with minute transverse striations ; segment III densely covered with similar long hairs, all the hairs arising from small swellings, segment also with minute transverse annulations especially distinct on apical one-quarter. Pronotum across humeral angles $1\frac{1}{3}$ times as wide as long in the middle (78 : 58), and twice as broad as across anterior margin (78 : 40) ; calli almost obsolete. Scutellum with transverse, somewhat obscure, rugosities. Section of cubital vein between apical angles of membranal cell and the point where it joins the cuneus $2\frac{2}{3}$ times as long as the distance between apical angle of cell and apex of membrane (51 : 19). Genitalia illustrated in Text-figs. 170-175. Length of body 7.0-7.15 mm., width across humeral angles 1.35 mm.

Colour. General colour testaceous. Antennal segment I brownish with a reddish tinge, the thickened base yellowish, paler also near apex ; segment II dark brown to fuscous, darker towards apex, base narrowly testaceous ; segment III black ; pubescence whitish. Pronotum and scutellum testaceous. Hemelytra fuscous with a reddish tinge, base of clavus and corium testaceous, cuneus more reddish ; membrane smoky black, vein reddish. Thoracic venter testaceous ; abdomen yellow, apical one-third to half black. Legs testaceous, tibiae more yellowish, apices of tibiae and tarsi entirely fuscous. Pubescence on venter and legs pale, those on the dark spots of legs also dark in colour.

FEMALE. The only specimen examined is damaged. But colour, in general, agrees with that of the male.

MATERIAL EXAMINED. FIJI : Naurosi, 1 ♂, 1 ♀, x. 1920 ; 1 ♂, v. 1921 (all R. Veitch). Lototi, 1 ♂, 19.xii.1920 (W. Greenwood). Narina, 1 ♂, 14.ii.1940 (R. A. Lever). In B.M.

The peculiar covering of hairs on the antennae, the peculiar sculpturing on the dorsum, and the structure of the male genitalia makes the recognition of *E. thetis* easy. Although it is undoubtedly a good *Eucerochoris* species, it is however rather isolated from the other four species of the subgenus.

aspect of apex ; 179, right paramere ; 180, aedeagus : ventral view. 181-185 : *E. suspectus* Distant. 181, left paramere ; 182, the same : inner aspect of base ; 183, the same : inner aspect of apex ; 184, right paramere ; 185, aedeagus : ventral view.

Eucrocoris (Eucrocoris) suspectus Distant

(Text-figs. 181-185)

1904. *Eucrocoris suspectus* Distant, *Ann. Mag. nat. Hist.* (7) 13 : 271.

MALE. Structure. Head across eyes twice as broad as median length (78 : 39), and about four-fifths as wide as across humeral angles of pronotum (78 : 94) ; vertex nearly twice as broad as an eye (35 : 19). Eyes occupy two-thirds of height of head, inner margin emarginate. Rostrum reaches bases of mesocoxae. Relative lengths of antennal segments, 225 : 288 : 168 : (IV lost) ; segment I densely covered with very short erect hairs, rather gradually thickening towards apex, this club-shaped length being about one-third length of segment ; segment II about $1\frac{1}{2}$ times as long as thickness of segment, densely covered with very short erect hairs, the latter more sub-erect towards apex, also with scattered erect hairs ; and segment III densely covered with sub-erect hairs, and scattered longer hairs (as on segment II), also with minute transverse annulations ; antennal sclerites occupy middle two-thirds of length of inner margin of eyes. Pronotum across humeral angles $1\frac{1}{4}$ times as wide as long in the middle (94 : 71), and twice as wide as across anterior margin (94 : 45) ; calli rather prominent, somewhat separated from each other by a median flattening. Scutellum with obscure transverse rugosities. Hemelytral membrane with cubital vein between apical angles of cell and the point where it joins cuneus about $1\frac{2}{3}$ times as long as the distance between apical angle of cell and membranal apex (38 : 24). Genitalia illustrated in Text-figs. 181-185. Length of body 8.3-9.7 mm., width across humeral angles 1.57-1.66 mm.

Colour. General colour testaceous. Antennae black, with obscure reddish tinge, or reddish fuscous ; thickened base of segment I testaceous. Hemelytra very dark reddish fuscous, base of clavus testaceous, base of corium and embolium largely ochraceous or yellowish, cuneus more reddish ; membrane infumate, vein red. Venter testaceous. Coxae and femora, two broad bands on apical halves of hind femora, fuscous to black ; bases of tibiae broadly black, basal half to two-thirds dark testaceous, the rest testaceous ; tarsi fuscous. Pubescence on body and sub-erect hairs on antennae pale, erect hairs on antennae yellowish-brown or darker.

FEMALE. Structure. Head nearly $1\frac{2}{3}$ times as wide as long (79 : 46) ; vertex more than twice as wide as an eye (42 : 18). Relative lengths of antennal segments, 245 : 288 : 160 : 77 ; segment I and basal half of segment II with only scattered, short, erect hairs ; segment IV pubescent as on segment III. Pronotum with the following relative dimensions of breadth across humeral angles, median length, and width across pronotal collar, of 108 : 76 : 46. Cubital vein between apical angle of membranal cell and the point where it joins cuneus twice as long as distance between apical angle of cell and apex of membrane (49 : 24). Length of body 9.7-10.0 mm., width across humeral angles 2.00-2.05 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male, except : head sometimes black ; antennae sometimes extensively testaceous, except for a black band near base of segment I, and segments III and IV which are fuscous ; basal half of abdomen yellowish-white, base and apical half black ; legs usually more extensively dark, apical halves of

femora, bases of fore tibiae broadly, basal halves of middle tibiae, and basal two-thirds of hind tibiae, all being black.

MATERIAL EXAMINED. AUSTRALIA: Queensland, Townsville, 3 ♂ (including holotype), 3 ♀ (including paratype); 1 ♀, vi.1903; 1 ♀, ix.1903 (all F. P. Dodd). Brisbane, 1 ♀, 28.i.1913; 1 ♂ 1 ♀, 18.v.1925 (all H. Hacker). Bribie Is., 1 ♀, xii.1922 (H. Hacker). All in B.M.

The most notable features of *E. suspectus* are the form of the left paramere in the male, which is very large and curves only gently, and the cuticularized appendages in the vesica. The structure of the antennae is also notable, particularly in the type of pubescence and the relative lengths of the segments. The colour is rather variable; and more collecting may reveal a wider variation still.

Eucrocoris (Eucrocoris) festivus Miller

(Text-figs. 176-180)

1954. *Eucrocoris festivus* Miller, *Bull. ent. Res.* **45** (4): 705, 5 figs.

MALE. Structure. Head across eyes $1\frac{1}{2}$ times as broad as long in the middle (48:30), and three-fifths as wide as across humeral angles of pronotum (25:12). Eyes occupy two-thirds of height of head; inner margin emarginate. Rostrum reaches middle of mesobasisternum, about mid-way between bases of fore and middle coxae. Relative lengths of antennal segments, 140:234:135:58; segment I gradually thickening towards apex, the clavate portion about one-quarter to one-third of length of segment, with very sparse short erect hairs; segment II densely covered with long erect hairs, about $1\frac{1}{2}$ times as long as segment is thick, and also with short sub-erect hairs on apical one-fifth to one-quarter, the latter with minute nodules in addition; segments III and IV densely covered with short sub-erect hairs and isolated long erect hairs, with minute dense transverse annulations; antennal sclerites occupy middle two-thirds of length of inner margin of eyes. Pronotum across humeral angles $1\frac{1}{2}$ times as broad as long in the middle (79:58), and about $2\frac{1}{2}$ times as wide as across anterior margin (79:32); calli almost obsolete; no suture or depression demarcating collar. Scutellum smooth. Corium with dense, irregular, minute punctures; cubital vein beyond apical angle of membranal cell about $1\frac{2}{3}$ times as long as the distance between apical angle of cell and apex of membrane (33:19); apex of cell acutely elongate. Genitalia illustrated in Text-figs. 176-180. Length of body 4.0-4.5 mm., width across humeral angles 1.30 mm.

Colour. Head red; vertex suffused with black, in the middle with an elongate yellowish spot; anteclypeus black; gular region yellowish. Antennae black, segment I with reddish suffusion, or antennae extensively or almost entirely testaceous; pubescence brownish to black. Pronotum and scutellum fuscous or black, suffused with red; pronotum with large yellowish area in the middle, reflexed portion pale yellow. Clavus yellow, apex and basal one-third dark red, inner margin bright red in the middle; corium dark red, apical one-third pale yellow (except the bright red inner and apical margins, and the dark red outer margin); cuneus red, basal half of outer margin pale yellow; membrane infumate, vein red. Venter yellowish, abdomen

with extensive reddish markings. Legs pale yellow; apices of femora and tibiae and basal segment of tarsi testaceous, otherwise tarsi black. Pubescence on venter and legs pale.

FEMALE. Structure. Head nearly $1\frac{1}{2}$ times as broad as long (51 : 35); vertex $2\frac{1}{2}$ times as wide as an eye (28 : 11). Relative lengths of antennal segments, 156 : 227 : 139 : (IV lost); segment II sparsely covered with erect hairs, dense covering of sub-erect hairs on apical one-fourth. Length of body 5.6 mm., width across humeral angles 1.50 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

MATERIAL EXAMINED. NEW GUINEA : Aiyura, 5 ♂, 7 ♀ on *Cinchona*, vi. 1953 (R. Carne). In B.M.

E. festivus is very close to *E. horvathi*; and from the description it appears that *E. festivus* is only distinguishable in that it is smaller in size, its pronotum is distinctly broader than long, the relative lengths of antennal segments are different, its rostrum is much shorter (in *E. horvathi* it reaches middle of mesocoxae), and in the colour markings. The character mentioned by Miller (1954 : 705), that the femora are straight and not curved, is not valid; in fact the femora are feebly curved, as can be seen in the hind femora.

Eucerochoris (Ragwelellus) peregrinus sp. n.

(Text-figs. 186-193)

MALE. Structure. Head across eyes nearly twice as broad as long in the middle (60 : 34), and four-fifths as wide as pronotum across humeral angles (60 : 75); vertex twice as wide as an eye (30 : 15). Eyes occupy two-thirds of height of head; inner margin almost straight, only weakly emarginate. Rostrum reaches apices of middle coxae. Relative lengths of antennal segments, 199 : 265 : 183 : 83; segment I gradually clavate towards apex, the thickened region about one-quarter of length of segment, segment almost glabrous with only a few short erect hairs; segment II with a few isolated short erect hairs, apical two-thirds with a dense covering of short sub-erect hairs, scattered erect hairs a little longer than the thickness of segment, this portion of segment also with minute transverse annulations; segments III and IV with pubescence and sculpturing as on segment II at apex; antennal sclerites occupy more than half of middle length of inner margin of eyes (17 : 29). Pronotum across humeral angles $1\frac{1}{2}$ times as broad as median length (75 : 56), and nearly $2\frac{1}{2}$ times as broad as across anterior margin (75 : 31); calli flattened, delimited by a shallow suture posteriorly; collar very thick, nearly twice as thick as length of callus. Scutellum smooth. Cubital vein beyond apical angle of membranal cell about $1\frac{1}{2}$ times as long as the distance between apical angle of cell and apex of membrane (30 : 25). Last abdominal segment with a relatively long swollen projection on the dorsal lateral aspect. Genitalia illustrated in Text-figs. 186-193. Length of body 7.15 mm., width across humeral angles 1.35 mm.

Colour. General colour bright orange. Head, antennae, pronotal collar largely, posterior lobe of pronotum except a broad median band, apex of corium, cuneus and membrane entirely (including veins), apical two-fifths of femora, bases of tibiae,

and last two tarsal segments, all black. Abdomen sometimes with irregular fuscous markings. Tibiae yellowish-brown or testaceous. Pubescence shiny white or pale.

FEMALE. Structure. Head $1\frac{1}{2}$ times as broad as long (64 : 36) ; vertex twice as wide as an eye (32 : 16). Relative lengths of antennal segments, 190 : 260 : 180 : (IV lost). Relative dimensions of width across humeral angles of pronotum, median lengths of the latter, and width of anterior margin, 87 : 70 : 32. Cubital vein beyond apical angle of membranal cell $1\frac{1}{2}$ times as long as distance between apical angle of cell and apex of membrane (35 : 25). Last abdominal segment without a projection. Length of body 8.55 mm., width across humeral angles 1.60 mm. Otherwise, structure as in the male.

Colour. Similar to that of the male.

Holotype ♂. SOLOMON ISLANDS : Ysabel, Gatere, 19.ii.1956 (E. S. Brown).

Allotype ♀. Same data as for holotype. **Paratypes** 4 ♂. Same data as for holotype. All in B.M.

This species was recognized in 1956 by Mr. N. C. E. Miller as a new species of *Eucerochoris*, but he did not actually describe and name it.

***Eucerochoris (Ragwelellus) peregrinus numanumae* subsp. n.**

(Text-figs. 191–193)

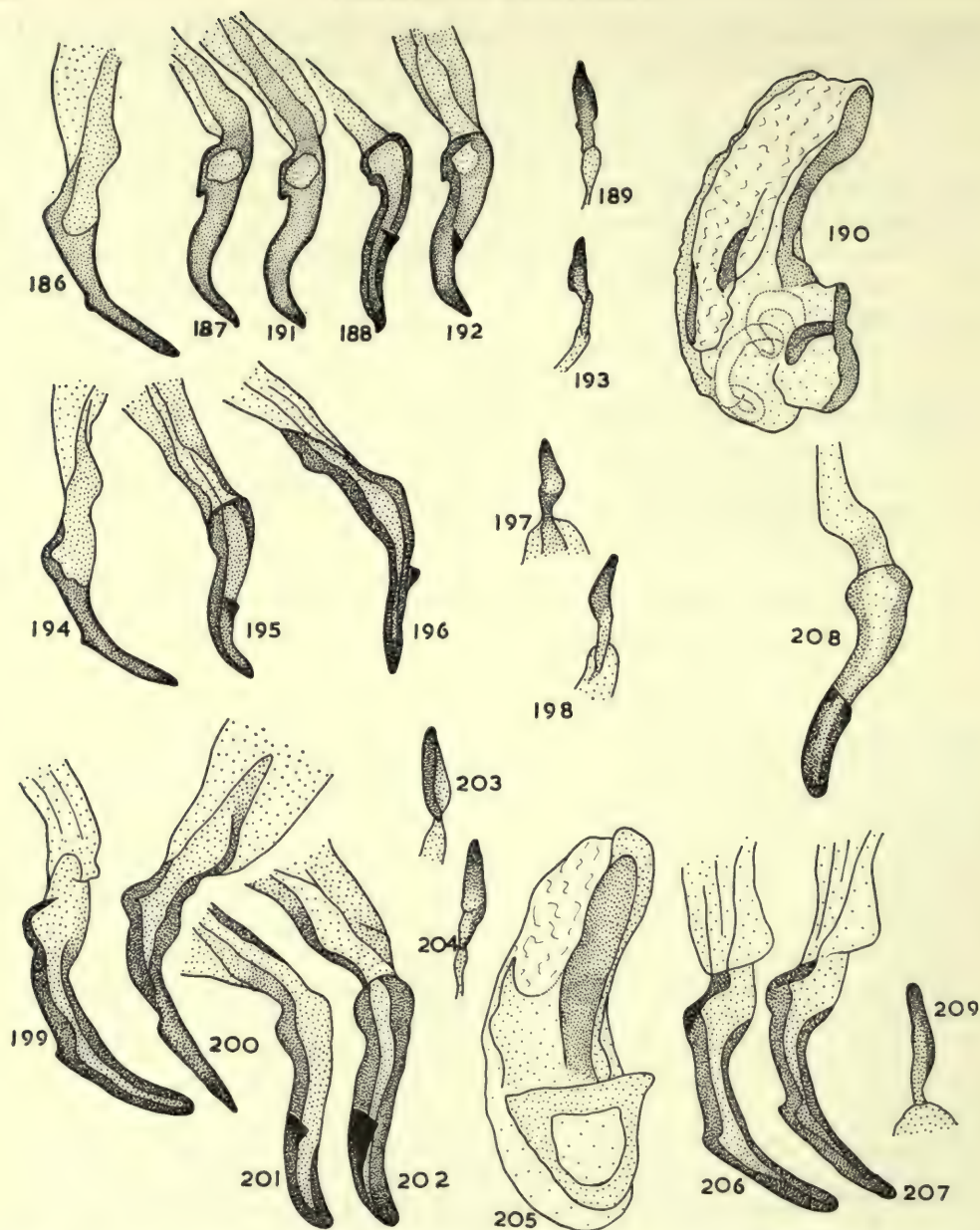
There are two specimens from the island of Bougainville that differ in colour and in external structure, to some extent, from the typical *E. (R.) peregrinus*, but whose male genitalia is almost identical with that of the latter. The present author hesitates to recognize the two specimens as representing a distinct species ; and it is here regarded as a subspecies of *peregrinus*.

FEMALE. Structure. Head a little more than $1\frac{1}{2}$ times as broad as long (64 : 38) ; vertex about $2\frac{1}{3}$ times as wide as an eye (32 : 14). Inner margin of eyes emarginate, more strongly so than in *peregrinus peregrinus*. Relative lengths of antennal segments, 189 : 250 : 160 : 69 ; segment I with clavate apical region less than one-fourth of length of segment. Pronotum across humeral angles $1\frac{1}{4}$ times as broad as long in the middle (86 : 67), and about $2\frac{1}{4}$ times as broad as anterior margin (86 : 38). Cubital vein beyond apex of membranal cell slightly longer than distance between apical angle of cell and apex of membrane (31 : 27). Length of body 7.75 mm., width across humeral angles 1.51 mm.

Colour. As in *peregrinus peregrinus*, except : middle half of antennal segment I and base of segment II broadly brownish ; posterior half of pronotal collar irregularly orange, posterior lobe entirely black ; apices of femora dark brown or fuscous (only apical one-fifth or less).

MALE. Structure. Head about $1\frac{3}{5}$ times as broad as long ; vertex $2\frac{1}{2}$ times as wide as an eye (32 : 13). Relative lengths of antennal segments, 190 : 260 : 180 : (IV lost). Pronotum with relative dimensions of width across humeral angles, median length, and width of anterior margin, of 76 : 59 : 34. Genitalia illustrated in Text-figs. 191–193. Otherwise, structure as in the female.

Colour. Similar to that of the female.



FIGS 186-209. Male genitalia in *Ragwelellus* subgen. n. 186-190: *E. peregrinus* *peregrinus* sp. and subsp. n. 186, left paramere; 187, the same: base flat on slide, inner aspect; 188, the same: inner aspect of apex. 189, right paramere; 190, aedeagus: right lateral view. 191-193: *E. peregrinus numanumae* sp. and subsp. n. 191, left paramere: base flat on slide, inner aspect; 192, the same: inner aspect of apex; 193, right paramere. 194-198: *E. vittatus* sp. n. 194, left paramere; 195, the same: base flat on slide, inner aspect; 196, the same: inner aspect of apex; 197 and 198, right paramere. 199-205: *E. pallipes* sp. n. 199, left paramere; 200, the same: more lateral view; 201 and 202, the same: inner aspect of apex; 203 and 204, right paramere; 205, aedeagus. 206-209: *E. kietae* sp. n. 206 and 207, left paramere; 208, the same: inner aspect of apex; 209, right paramere.

Holotype ♀. SOLOMON ISLANDS: Bougainville Is., Numa Numa, 31.v.1956 (E. S. Brown). *Paratype* ♂. Data as above, 1.vi.1956. Both in B.M.

***Eucrocoris (Ragwelellus) propinquus* sp. n.**

FEMALE. Structure. Head nearly twice as wide as long (64 : 35), and two-thirds as wide as pronotum across humeral angles (64 : 90); vertex twice as wide as an eye (33 : 15). Eyes occupy three-quarters of height of head; inner margin almost straight, only weakly emarginate. Rostrum reaches nearly apices of middle coxae. Relative lengths of antennal segments, 221 : 286 : 202 : (IV lost); segment I with apical one-quarter clavate, segment almost glabrous, except for minute very sparse hairs and a few short hairs at apex; segment II with apical one-quarter to one-third densely covered with short sub-erect hairs and scattered longer erect hairs, the latter slightly longer than thickness of segment, the rest of the segment sparsely covered with minute hairs; segment III densely covered with similar hairs as on apical portion of segment II; antennal sclerites occupy two-thirds of middle length of inner margin of eyes. Pronotum across humeral angles $1\frac{1}{2}$ times as broad as long in the middle (90 : 75), and more than $2\frac{1}{2}$ times as broad as anterior margin (90 : 35); calli distinct, somewhat swollen, about $1\frac{1}{2}$ times as thick as length of callus. Scutellum with obscure, fine, transverse rugosities. Cubital vein beyond apex of membranal cell only slightly longer than distance between apex of cell and apex of membrane (35 : 32). Length of body 8.65 mm., width across humeral angles 1.64 mm.

Colour. General colour orange. Head, antennae, pronotum (except calli, posterior margin of collar, and a broad median band on posterior lobe), apex of corium, cuneus and membrane wholly, apical three-fifths of femora, basal three-fifths of tibiae, and last two segments of tarsi, black; tibiae and tarsi otherwise stramineous. Pubescence on legs and erect hairs on antennae yellowish-brown, sub-erect hairs on antennae shiny white.

MALE. Unknown.

Holotype ♀. SOLOMON ISLANDS: Guadalcanal, Sutakiki, 27.vi.1956 (E. S. Brown). *Paratype* ♀. Same locality, Gold Ridge, 30.vi.1956 (E. S. Brown). Both in B.M.

E. propinquus closely resembles *E. peregrinus*. But the relative lengths of antennal segments are entirely different, the cubital vein in *E. propinquus* falls short of the apex of the hemelytral membrane by a longer distance, the femora are much darker in colour, and the tibiae are extensively black.

***Eucrocoris (Ragwelellus) vittatus* sp. n.**

(Text-figs. 194-198)

MALE. Structure. Head $1\frac{2}{3}$ times as broad as long (54 : 33), and four-fifths as broad as pronotum across humeral angles (54 : 70); vertex nearly twice as wide as an eye (26 : 14). Eyes occupy about three-quarters of height of head; inner margin emarginate. Rostrum reaches apices of middle coxae. Relative lengths of antennal segments, 164 : (II to IV lost); segment I with less than one-fifth thickened, segment

covered with isolated minute hairs; antennal sclerites occupy three-fifths of middle length of inner margin of eyes. Pronotum across humeral angles $1\frac{1}{4}$ times as broad as long in the middle (70 : 55), and $2\frac{1}{2}$ times as broad as anterior margin (70 : 28); calli somewhat distinct. Membranal cell with apex only a little beyond apex of cuneus, cubital vein beyond apex of cell about two-thirds as long as the distance between apex of cell and apex of membrane (25 : 39). Last abdominal segment with a relatively long swollen projection on dorsal lateral margin (as in *E. peregrinus*). Genitalia illustrated in Text-figs. 194-198. Length of body 6.35 mm., width across humeral angles 1.24 mm.

Colour. General colour orange. Head, a large band on either side of posterior lobe of pronotum, anterior half of collar except a middle streak, apex of corium, cuneus and membrane entirely, apical one-quarter of femora, bases of tibiae, and last tarsal segment, all black; base of head testaceous; antennal segment I fuscous; tibiae and tarsi stramineous.

FEMALE. Unknown.

Holotype ♂. BRITISH SOLOMONS: Sa. Isabel, ii. 1933 (R. J. A. Lever). In B.M.

E. vittatus is very closely related to *E. peregrinus*; for instance, the male genitalia in the two species are very similar. *E. vittatus* may, however, be differentiated in that the apex of the membranal cell only surpasses the apex of the cuneus by a very short length, the head is narrower, the first antennal segment is shorter and only a short length of it is thickened, the pronotum has a very broad orange band in the middle, and in that the anterior lobe of the pronotum is extensively orange.

Eucercoris (Ragwelellus) pallipes sp. n.

(Text-figs. 199-205)

MALE. *Structure.* Head $1\frac{2}{3}$ times as broad as long (68 : 41), and about three-quarters as broad as pronotum across humeral angles (68 : 88). Eyes occupy about three-quarters height of head; inner margin deeply emarginate. Rostrum extends to middle of mesocoxae. Relative lengths of antennal segments, 248 : 323 : 183 : 94; segment I with about apical one-fifth thickened, with very sparse short erect hairs, less sparse towards apex; segment II with basal one-third sparsely covered with short erect hairs and longer erect hairs, the latter shorter than thickness of segment, apical two-thirds densely covered with short erect hairs (becoming sub-erect towards apex) and isolated longer erect hairs, apex with fine annulations; segments III and IV very densely covered with short sub-erect hairs and scattered long erect hairs, the latter at most twice as long as thickness of segment, and also covered with fine transverse annulations and minute swellings; antennal sclerites occupy two-thirds of middle length of inner margin of eyes. Pronotum across humeral angles $1\frac{1}{4}$ times as broad as long in the middle (87 : 68), and about $2\frac{1}{4}$ times as broad as anterior margin (87 : 39); calli prominent, swollen, and more or less cone-like, separated in the middle by a depression; collar with a distinct posterior suture at the sides, in the middle obsolete, about as thick as length of callus. Scutellum finely transversely rugose, except at apex. Cubital vein beyond apex of membranal cell $1\frac{2}{3}$ times as long as distance between apex of cell and apex of membrane (35 : 25).

Last abdominal segment with a prominent cone-like swelling (no projection as in *E. peregrinus*). Genitalia illustrated in Text-figs. 199–205. Length of body 8.0 mm., width across humeral angles 1.53 mm.

Colour. Head testaceous, anteclypeus dark red or fuscous. Antennae black, segment I and basal one-third of segment II testaceous or reddish. Pronotum testaceous entirely, or black with collar at the sides, calli extensively, and ventral margin of inflexed portion largely testaceous. Scutellum black with base narrowly testaceous, or entirely testaceous. Hemelytra fuscous to black, veins dark reddish. Venter and legs testaceous; apical half of abdomen with extensive fuscous markings; tibiae towards apices and first tarsal segment pale yellowish, last two tarsal segments fuscous to black. Pubescence pale.

FEMALE. Structure. Head nearly twice as broad as long (76 : 41); vertex twice as wide as an eye (38 : 19). Eyes occupy two-thirds of height of head. Relative lengths of antennal segments, 260 : 334 : 190 : 92; only apical half of segment II densely pubescent. Relative dimensions of width across humeral angles of pronotum, median length of the latter, and width of anterior margin, 113 : 81 : 43. Cubital vein beyond apex of membranal cell $1\frac{1}{2}$ times as long as distance between apex of cell and apex of membrane (37 : 31). Last abdominal segment without a swelling. Length of body 9.2 mm., width across humeral angles 2.03 mm.

Colour. Similar to that of the male.

Holotype ♂. SOLOMON ISLANDS: Guadalcanal, Rua Vatu, 12.x.1956 (E. S. Brown). *Allotype* ♀. Guadalcanal, Terere, 30.iii.1955 (E. S. Brown). *Paratypes.* Guadalcanal, 1 ♂, ii.1932; Guadalcanal, Lunga, 1 ♂; same locality, 1 ♂, 9.vi.1935 (all R. A. Lever). All in B.M.

E. pallipes and the next species (*E. kietae*) apparently form a group within the subgenus *Ragwelellus* distinct from the three other species of the subgenus (*peregrinus*, *propinquus*, and *vittatus*). The two species may be distinguished by the presence of a cone-like prominence on the last abdominal segment of the male (instead of a long projection), by the swollen, larger, and quite distinct pronotal calli, by the deeply emarginate inner margin of eyes, and by the more robust body.

Euceroctis (Ragwelellus) kietae sp. n.

(Text-figs. 206–209)

MALE. Structure. Head twice as wide as long (69 : 35), and about five-sixths as broad as pronotum across humeral angles (69 : 85); vertex twice as wide as an eye (34 : 17). Eyes occupy three-fourths of height of head; inner margin deeply emarginate. Rostrum extends to middle of mesocoxae. Relative lengths of antennal segments, 228 : (II to IV lost); segment I rather densely covered with short erect hairs, apical one-sixth thickened. Pronotum across humeral angles a little less than $1\frac{1}{2}$ times as broad as long in the middle (85 : 70), and about $2\frac{1}{2}$ times as broad as anterior margin (85 : 37); calli prominent, distinct, cone-like (though less prominent than in *pallipes*), separated in the middle by a depression; collar about as thick as length of callus, with a short suture on either side posteriorly. Scutellum finely

transversely rugose, except at apex. Cubital vein beyond apex of membranal cell about $1\frac{1}{2}$ times as long as distance between apex of cell and apex of membrane (35 : 24). Last abdominal segment with a prominent cone-like swelling (as in *pallipes*). Genitalia illustrated in Text-figs. 206–209. Length of body 8.35 mm., width across humeral angles 1.48 mm.

Colour. General colour testaceous. Head black. Antennal segments I and II fuscous to black, middle of segment I and base of segment II broadly suffused with red or testaceous. Cuneus dark red, fuscous towards apex; membrane infumate, vein red. Apical halves of femora with two fuscous bands; tibiae fuscous basally; tibiae and tarsi pale yellowish, last two tarsal segments black. Pubescence pale in colour.

FEMALE. Unknown.

Holotype ♂. SOLOMON ISLANDS: Bougainville Is., Kieta, v. 1934 (J. L. Froggatt).

E. kietae is very closely allied to *E. pallipes*, and the male genitalia are very similar in structure. The first antennal segment is, however, shorter, and the pronotal calli are less prominent; *E. kietae* may also be readily distinguished by the colour, particularly by the extensively pale hemelytra, and the dark femora and tibiae.

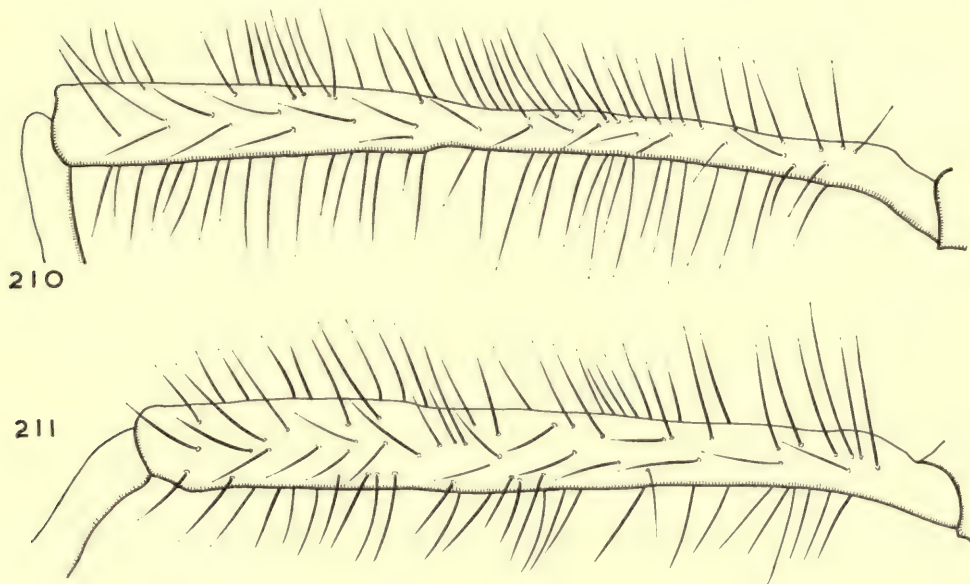
RAYIERIA gen. n.

Two species definitely belong to this genus, *Eucerochoris braconoides* and *Eucerochoris basifer*, both described by Walker in 1873. The most important characters that distinguish these two species from *Eucerochoris*, as re-defined in the present work are: (1) the bristly body and appendages in the new genus, (2) the swollen and projecting frons, (3) the swollen and very large pronotal collar, and (4) the very short rostrum. Although the male genitalia in both species has not been examined, there is no doubt that the two species represent a new genus, as described below.

Another species, *Eucerochoris tumidiceps* Horváth, appears to belong to *Rayieria*, although Horváth (1902 : 610) stated that "the antennae and legs (are) not hirsute." He did not mention pubescence on the body either, although he noted that *E. tumidiceps* is allied to *E. braconoides*.

DESCRIPTION. Body long and slender; body and appendages shiny, densely covered with long, pale, erect, seta-like hairs. Head somewhat transverse; vertex distinctly convex, projecting above eyes, posteriorly with a median sulcus; frons swollen between bases of antennae (Text-figs. 212 and 213); anteclypeus moderately inflated, delimited from frons by a transverse suture, outline of anterior margin straight as seen in profile; neck distinct (Text-figs. 214 and 215); eyes far removed from anterior margin of pronotum, viewed from the side appear to occupy about half height of head, inner margin very nearly linear. Rostrum extends nearly to apices of fore coxae. Antennae longer than body; antennal sclerites very large, oval in shape, adjacent to eyes, occupy about three-quarters of middle length of inner margin of eyes; segment I shortly bent at base, thickened towards apex (Text-figs. 210–211), the rest of the antennae thinner; segment I smooth, remaining segments with minute swellings. Anterior lobe of pronotum distinctly narrower than posterior lobe; the latter convex and declivous; calli distinct, convex, separated in the middle

by a flattening, reaching sides of pronotum ; collar very large and inflated (Text-figs. 214 and 215), markedly thicker than posterior femur at apex ; posterior margin straight ; anterior acetabula visible from above. Scutellum finely, almost obscurely, transversely rugose, disc slightly swollen, apex somewhat rounded, about three-quarters as long as broad ; mesoscutum a little exposed. Hemelytra curved inwards



FIGS. 210 and 211. First antennal segment in *Rayieria*. 210, *R. basifer* (Walker) ; 211, *R. braconoides* (Walker).

laterally in the middle ; cuneus narrow, but rather short ; membranal cell with angular apex, the latter distinctly surpassing apex of cuneus. Legs long and slender ; hind femora incrassate apically ; for tibiae with a short, spur-like projection at one end of tibial comb ; tarsal claws gently curved, more strongly curved at apex. Type-species : *Eucerochoris basifer* Walker.

***Rayieria basifer* (Walker) comb. n.**

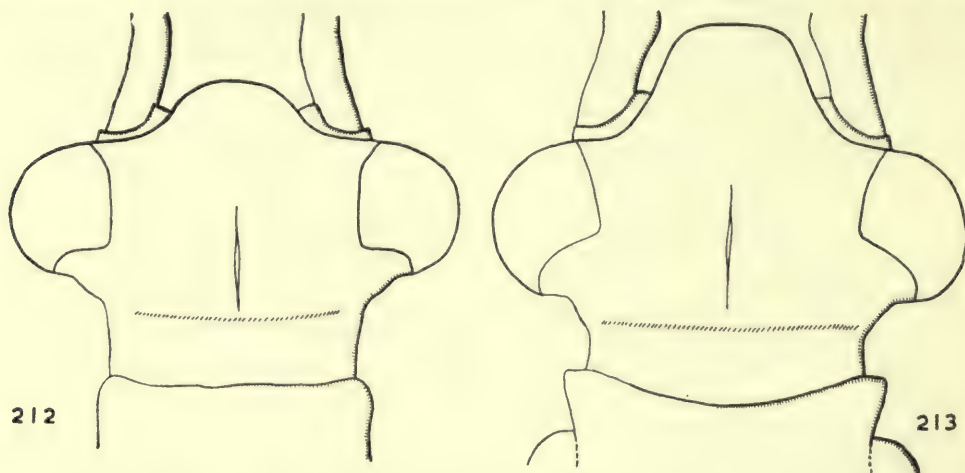
(Text-figs. 210, 212, and 214)

1873. *Eucerochoris basifer* Walker, *Cat. Hem. Het.* 6 : 164.

FEMALE. Structure. Head $1\frac{3}{4}$ times as broad as long (74 : 43), and two-thirds as broad as pronotum across humeral angles (74 : 113) ; vertex $2\frac{1}{2}$ times as wide as an eye (41 : 16) ; frons extending anteriorly beyond level of antennal sclerites by a length equal to about half dorsal length of an eye (9 : 21) (Text-fig. 212). Relative lengths of antennal segments, 136 : 232 : 165 : (IV lost) ; segment I and basal one-quarter to one-third of segment II with only long hairs, the rest of antennae in

addition with short, shiny white, sub-erect hairs, on segment III (and probably also on IV) more dense than the long erect hairs; segment I near base about as thick as segment II and half as thick as at the clavate apex, almost apical half clavate (Text-fig. 210). Pronotum across humeral angles nearly $1\frac{1}{2}$ times as broad as long in the middle (113 : 91), and about $2\frac{3}{8}$ times as broad as anterior margin (113 : 43); calli only a little swollen. Cubital vein beyond apex of membranal cell more than half as long as cuneus beyond apex of embolium (43 : 78). Length of body 9.35 mm., width across humeral angles 2.05 mm.

Colour. General colour black. Head (excluding vertex, frons, and anteclypeus), pronotum, scutellum, pro- and mesothoracic venter, fore and middle coxae, and



FIGS. 212 and 213. Dorsal view of head in *Rayieria*. 212, *R. basifer* (Walker); 213, *R. braconoides* (Walker).

bases of fore femora narrowly, bright red; neck red; antennal sclerites and base of segment I narrowly testaceous. Corium (excluding embolium) with a large white spot near middle; membrane infumate, vein reddish-brown. Abdominal segments with white margins; one or two segments near base wholly white.

MALE. Unknown.

MATERIAL EXAMINED. AUSTRALIA: 2 ♀ (including holotype). Central Australia, Hermannsburg, 1 ♀, 1911 (H. J. Hillier). SE. Queensland, Tambaourine Mts., 1 ♀, 19-26.iv.1935; 1 ♀, 11-17.v.1935 (R. E. Turner). All in B.M.

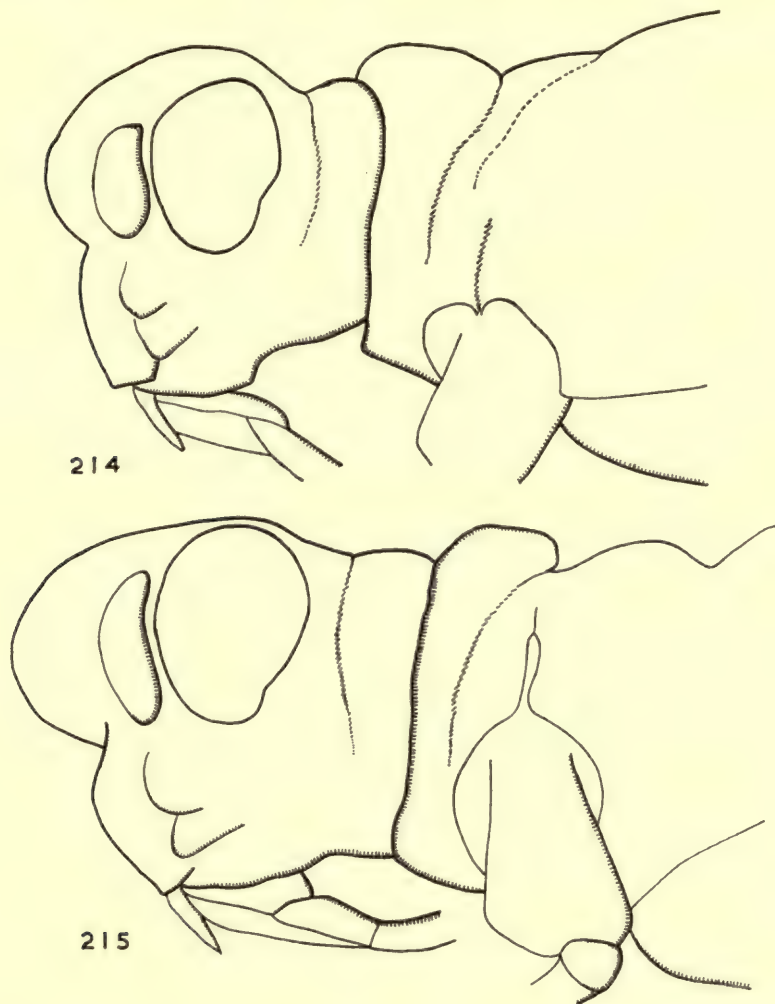
***Rayieria braconoides* (Walker) comb. n.**

(Text-figs. 211, 213 and 215)

1873. *Euceroctis braconoides* Walker, *Cat. Hem. Het.* 6 : 164.

FEMALE. Structure. Head $1\frac{1}{4}$ times as broad as long (80 : 64), and two-thirds as broad as pronotum across humeral angles (80 : 118); vertex $2\frac{1}{2}$ times as wide as an

eye (45 : 18) ; frons extending beyond level of antennal sclerites by a length equal to three-quarters dorsal length of an eye (18 : 25) (Text-fig. 213). Relative lengths of antennal segments, 130 : 228 : (III and IV missing) ; segment I and basal half of



FIGS. 214 and 215. *Rayieria*—head and pronotum in profile. 214, *R. basifer* (Walker) ; 215, *R. braconoides* (Walker).

segment II with only long erect hairs, apical half of segment II in addition with a moderately dense covering of short, shiny white, sub-erect hairs ; segment I gradually thickened towards apex, and here only $1\frac{1}{2}$ times as thick as near base (Text-fig. 211), segment II distinctly thinner than segment I. Pronotum across humeral angles $1\frac{1}{3}$ times as broad as long in the middle (118 : 89), and $2\frac{1}{3}$ times as broad as

anterior margin (118:51); calli prominent, convex. Cubital vein beyond apex of membranal cell about half as long as cuneus beyond apex of embolium (44:85). Length of body 10.35 mm., width across humeral angles 2.12 mm.

Colour. Head testaceous; a streak along inner margin of eyes dorsally, and anteclypeus wholly, black; an obscure short streak on middle of vertex fuscous. Pronotum testaceous, posterior lobe (except for posterior margin narrowly and a lateral band on either side) black. Scutellum black, a longitudinal streak in the middle testaceous. Hemelytra dark brown to fuscous; clavus towards apex, and embolium, yellowish-brown; basal half of corium bright red; membranal vein dark red. Legs black; fore coxae wholly and apex of mesocoxae testaceous. Venter black; metaepimeron, margins of abdominal segments broadly, third and fourth visible abdominal segments wholly, and last segment largely, white.

MALE. Unknown.

MATERIAL EXAMINED. WEST AUSTRALIA: 1 ♀. Holotype. In B.M.

This species may be characterized by the much longer frontal prominence, the thicker antennal segment I showing no particular club-like thickening at apex as in *R. basifer*, the swollen and convex pronotal calli, and by the colour, especially the reddish head, the extensive black area on the posterior lobe of the pronotum, the absence of a white spot on the corium, and the black thoracic venter.

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A REVISION OF THE ATHALIINI
(HYMENOPTERA:TENTHREDINIDAE)

ROBERT B. BENSON



BULLETIN OF
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ENTOMOLOGY Vol. II No. 7
LONDON: 1962

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SYNOPSIS

The Athaliini are defined as a tribe of the Tenthredininae comprising 4 genera (3 of them monotypic) containing in all 64 species with 10 subspecies. Of these, 1 genus, 9 species and 3 subspecies are described as new, and many of the previously described species are reduced to synonymy. Keys are given to the 4 genera and the 8 species groups of *Athalia* as well as to all the species and subspecies.

Discussions on phylogeny, dispersal and distribution in relation to host plant associations are included, together with a host-plant list.

1. INTRODUCTION AND ACKNOWLEDGEMENTS

APART from its taxonomic interest as a genus from near the base of the Tenthredinid stem showing some primitive features, *Athalia* is also interesting biogeographically and biologically. Its food-plant association is entirely with herbaceous plants ;

throughout its range, which is restricted to the Old World, occur species attached to Cruciferae and destructive to cultivated vegetables of this family, such as cabbages, turnips and mustard.

My own studies in the genus began over thirty years ago after reading Dr. Priesner's paper (1928). Since then I have subjected to intensive study any material I could acquire; and I have seen the *Athalia* in most of the European Museums and have examined most of the types of previous authors.

The following are some of the many people I wish to thank for helping me by collecting and sending material, or lending me material from their private collections or the collections over which they had charge:

- Dr. G. Arnold (National Museum of Southern Rhodesia, Bulawayo);
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- Dr. L. Berland (Muséum National d'Histoire Naturelle, Paris);
- Dr. E. McC. Callan (Grahamstown, South Africa);
- Dr. Carnegie (Umtali, Southern Rhodesia);
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- Dr. E. Leloup (Directeur, Institut Royal des Sciences Naturelles, Bruxelles) for enabling me to study their rich collections of *Athalia* from the Congo region, mainly collected by G. F. de Witte, 1933-35;
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Finally I should like to thank Arthur Smith for his beautiful drawings (Text-figs. 1-22, 44 and 56-58) and Miss J. A. Black for typing the manuscript.

2. THE TAXONOMIC BACKGROUND

Despite its taxonomic and economic interest the genus *Athalia* has never previously been revised as a whole, though assuredly Konow published two separate keys, one to 17 African species (1908 (1)) and one to 20 Palaearctic and Oriental species (1908 (2)), though the two sections were not distinguished taxonomically apart from geography. In these keys the species were distinguished almost entirely on colour-pattern with a few references to pubescence and gross clypeal shape. Only in distinguishing *A. paradoxa* from *A. circularis* (= *lineolata*) is any reference made to the female hypopygium. Enslin (1913) included a more detailed revision of European *Athalia* on the same general lines. And yet in their interpretation of *A. lineolata* they included four or five different species with distinct forms of hypopygium as shown by Priesner (1928) and Benson (1931). And later the whole of the large collection of African *Athalia* in the British Museum (Natural History) was named and recorded in detail by Forsius (1931) ; though in the present work different criteria are used for recognizing and distinguishing species and the list published by Forsius is now superseded.

In the present study the genera *Hennedyia* and *Hennedyella* are being associated with *Athalia* to form a distinct tribe of the Tenthredininae ; and a fourth genus *Hypsathalia* is being erected for the high Himalayan species heretofore known as *Athalia przewalskyi*. The genus *Athalia* itself is being further divided into eight species-groups based mainly on the form of the clypeus.

3. DISTRIBUTION

The general pattern of the distribution of the eight species-groups of *Athalia* and the three monotypic genera is shown in Table I.

From this it can be seen that the two primitive genera *Hennedyia* and *Hennedyella* are known only from the West Mediterranean and Burma respectively and are probably early Tertiary relics. The high Himalayan *Hypsathalia* is likewise no doubt derived from lowland Tertiary stock, possibly the same stock that gave rise to *Athalia nigromaculata* and *A. sikkimensis*, which alone share with it a characteristic colour pattern, with a dorsal row of black spots each side of the abdomen. These two species form a complex related to the *lugens*-complex of the *rosae*-group of *Athalia*.

These two complexes are centred in the mountains of tropical South-east Asia where they are represented by six species, only one of which, *A. lugens*, occurs in Europe ; but most of the width of North Asia now separates the range of the European *A. lugens lugens* from the range of *A. lugens proxima* fringing the Pacific coast of East Asia from Kamtchatka to Borneo and Java. Similarly widely separated

west and east subspecies-pairs occur in *A. scutellariae*, *A. rosae*, *A. liberta* and *A. circularis*, and not far removed from this the species-pair *A. cordata* and *A. kashmirensis*. It is not clear when last the now widely separated geographical ranges of these subspecies and species-pairs were continuous populations. It may have been during the Post-Glacial Climatic Optimum (Moreau, 1955) if Central Asia was at that time sufficiently humid for a continuous deciduous forest belt to exist between Europe and East Asia across Southern Siberia. The *cordata-kashmirensis* species-pair have diverged from each other more than the subspecies-pairs have and may therefore date from an earlier separation possibly after the last Interglacial or perhaps very much earlier. But now, Dr. Zhelochovtsev tells me, except for *A. ahngerii*, *Athalia* are absent from the steppes of Central Asia and occur only sparingly in such places as river valleys, swamps and mountains.

No less than three species-groups seem to be centred now in South-east Europe where they presumably survived the Glacial Period in an area well known to be rich in Tertiary plant and animal relics.

TABLE I.—*Distribution of Athaliini*

(The numbers in heavy type indicate maximum concentration)

	Total	Africa	Madagascar	W. Medit.	S.E. Europe and E. Medit.	C. Europe	Temp. E. Asia	Tropical E. Asia	Himalayas
<i>Hennedyia</i> . . .	I	—	—	I	—	—	—	—	—
<i>Hennedyella</i> . . .	I	—	—	—	—	—	—	I	—
<i>Hypsathalia</i> . . .	I	—	—	—	—	—	—	—	I
<i>Athalia</i>									
1. <i>scutellariae</i> Group .	3+I	—	—	—	2	I	I	—	—
2. <i>bicolor</i> Group . . .	5	—	—	2	4	2	I	—	—
3. <i>glabricollis</i> Group .	7+I	5	—	I	2	I	—	—	—
4. <i>cordata</i> Group . . .	10+I	3	—	2	2	2	2	4	—
5. <i>rosae</i> Group									
(a) <i>rosae</i> complex	13+4	{—	I	3	4	5 { 4 I	4 { 2 2	8 { 2 6	—
(b) <i>lugens</i> complex									
6. <i>furvipennis</i> Group .	16	16	—	—	—	—	—	—	—
7. <i>himantopus</i> Group .	I+2	1+2	—	—	—	—	—	—	—
8. <i>vollenhoveni</i> Group .	6+I	6+I	—	—	—	—	—	—	—
Total number of species .	6I(8)	31(5)	I	8(4)	14(5)	11(5)	10(3)	12(2)	0
of <i>Athalia</i> (and groups) .	+10	+3					+I		
+ subspecies									
Number of spp. of other .	3	—	—	I	—	—	—	I	I
Athaliini genera									
Total spp. of Athaliini .	64	31	I	9	14	11	10	13	I
+ subspecies	+10	+3					+I		

The solitary species in Madagascar, *A. malagassa*, is closely related to the Eurasian *A. rosae*, likewise a pest on cultivated vegetable crucifers; but no species of the

rosae-group are now found in Central or Southern Africa. The presence of Palaearctic plants and animals in Madagascar has never been satisfactorily explained (see Moreau, 1952) as there is no evidence of there having been any bridge of non-tropical climate across the equator in Tertiary times or since.

Thirty-one species are known from Africa in five different species-groups, three of which are restricted to Africa and another, the *glabricollis*-group, is centred there. This might point to Africa as being the country of origin of the whole group but without any fossil evidence this cannot be maintained with any certainty.

4. DISPERSAL AND SWARMING

The only records of sawflies seen crossing the sea and surviving the passage refer to *Athalia rosae* (see Benson, 1950). A vast cloud of this species was observed arriving on the east coast of England in the summer of 1782 (Newport, 1838), and afterwards many were found on the shore washed up by the sea, heaped up in places to a depth of 2 in. The species was at that time a serious pest of turnips in England in sequences of hot summers, but less so in sequences of cold and wet ones. Its importance as a pest diminished in the second half of the nineteenth century; and at the beginning of the twentieth century it was virtually extinct in England, and had disappeared also in Scandinavia and other parts of North Europe.

During the warm summers just before 1940 the species began to increase and spread north again from its centres in Southern Europe. In 1945 it reached the Channel Islands and crossed to England, where it spread rapidly over most of the Southern Counties. It also reached Southern Sweden, where I found it near Lund in August, 1948. And though it persisted sparingly in the freshly invaded areas for several years the recent sequence of mainly wet dull summers and cold dry springs has not favoured its survival.

During the same period that *A. rosae* spread again over Southern England, *A. bicolor* also reappeared and was found plentifully. In the preceding decades this had been an exceptionally scarce species in Britain and it is again now. But there is no evidence of any immigrant swarm of this species at this time, as in *A. rosae*. Then in August, 1941 I myself observed a very vast swarm of *A. cordata* moving eastwards across country in North Devon.

The period from about 1920 to 1950 was notable, in Britain and North-western Europe generally, for the increase in numbers and the spread not only of sawflies but of many other insects that had been in eclipse for two or three decades. These include the well-documented upsurge of the Comma Butterfly (*Polygonia c-album* (L.)) and the White Admiral (*Limenitis camilla* (L.)). One of the most remarkable things about these increases is that no one has been able to explain them satisfactorily. If such great changes in abundance and distribution can take place in modern times from unobserved causes, how can we estimate what might have happened during some of the major climatic changes known to have taken place in the Post Glacial Period? How, for example, did the Climatic Optimum of Atlantic Times affect such species?

5. HOST-PLANT RELATIONSHIPS

The larval morphology of *Athalia* has been described in detail recently by Lorenz & Kraus (1957). Those species that have been studied are potentially many-brooded and continue producing broods throughout the year so long as the temperature and humidity are equable.

It is interesting that five of the eight different groups of *Athalia* are entirely, or, so far as is known, mainly associated with Cruciferae, and that four of these occur in Africa; and that of these four that are African three include mature cabbage (*Brassica oleracea* L.) among the plants attacked, several species such as *A. himantopus*, *A. sjoestedti* and *A. vollenhoveni* being major pests of cabbage. Yet the original home of cabbage is thought to be Atlantic and Mediterranean Europe, the only regions where cabbage still grows wild today (Clapham, Tutin & Warburg, 1952: 152, etc.).

On the other hand the Eurasian species on Cruciferae will at most only eat cabbages as seedlings, though species such as *A. rosae*, *A. lugens proxima* and *A. japonica* are major pests of turnip plants (*Brassica rapa* L.).

It would be interesting to discover what are the native host-plants of those African species that are now pests on cabbage and other crucifers.

The recorded host-plants in the genus are listed below. All are herbaceous plants and mostly belong to open or partly open communities, of warm, temperate, often dry regions. Both the Cruciferae and Labiatae, the predominating families, are associated mainly with a similar type of climate. But it is necessary to emphasize that, apart from European species, the only host-plants recorded for the genus for certain are cultivated plants and mostly not themselves native to the countries where they are attacked by native *Athalia*. The host-plants of species of sawflies not attacking crops are still mainly unknown outside Europe.

6. HOST-PLANT LIST

(The species-group numbers precede the names of the *Athalia* spp.)

COMPOSITAE

Arctium lappa L. : (4) *circularis*.

CRASSULACEAE

Sedum album L. : (5) *cornubiae*.

CRUCIFERAE

Alliaria officinalis Bieb. and *petiolata* (Bieb.) Cavara & Grande : (5) *liberta*.

Arabidopsis thaliana (L.) Heynh. : (5) *liberta*.

Armoracia rusticana Gaertn., Mey. & Scherb. : (5) *rosae*.

Barbarea spp. : (5) *japonica*, *rosae*.

Brassica napus L., *nigra* (L.) Koch, *junceae* L. and *rapa* L. (= *campestris* L.) : (5) *japonica*, *malagassa*, *lugens infumata*, *lugens proxima* and *rosae*; (6) *furvipennis*; and (8) *sjoestedti*.

Brassica oleracea L. : (6) *furvipennis* ; (7) *himantopus* ; (8) *sjoestedti* and *vollenhoveni*.

Cardamine hirsuta L. : (5) *liberta*.

Diplotaxis tenuifolia (L.) D.C. : (3) *glabricollis*.

Erysimum cheiranthoides L. : (3) *glabricollis*.

Lepidium sativum L. : (5) *lugens proxima* ; (8) ? *schweinfurthi*.

Nasturtium spp. : (7) *himantopus*.

Raphanus raphanistrum L. : (3) *glabricollis* ; (5) *japonica*, *lugens proxima*, *malagassa* and *rosae*.

Rorippa amphibia (L.) Bess. : (5) *rosae*.

Sinapis alba L., and *arvensis* L. : (3) *glabricollis* ; (5) *japonica*, *liberta* and *rosae*.

Sisymbrium officinale (L.) Scop., etc. : (3) *glabricollis* ; (5) *liberta* and *rosae*.

LABIATAE

Ajuga reptans L. : (4) *cordata*.

Coleus barbatus Benth. : (6) ? *mellis*.

Glechoma hederacea L. : (4) *circularis*.

Salvia : (6) ? *mellis*.

Scutellaria gallericulata L. and *minor* L. : (1) *scutellariae*.

PLANTAGINACEAE

Plantago spp. : (4) *cordata*.

RANUNCULACEAE

Ranunculus spp. : (2) ? *bicolor*.

SCROPHULARIACEAE

Antirrhinum orontium L. : (4) *cordata*.

Veronica spp. : (4) *circularis*.

7. THE 9-SEGMENTED ANTENNA IN TENTHREDINIDAE

One of the characters distinguishing the Tenthredinidae from the other families of the Tenthredinoidea is that the antenna is normally 9-segmented in all its three main subfamilies : Selandriinae, Tenthredininae and Nematinae.

This character must therefore have become established, at least potentially, and correlated with other Tenthredinid characters before the original stock diverged into these three main subfamilies, as it is unlikely to have arisen entirely independently in each line of them. Any departures from this number of antennal segments would seem to be due either to direct descent from pre-9-segmented stock or to the break-down of the close correlation between the 9-segmented antenna and the other Tenthredinid characters. The following Tenthredinidae have less or more than 9 segments to the antenna, but appear to be closely related to forms having normal 9-segmented antennae and would seem to have been descended from such stock : Heptamelini (7-8) and Dulophanini (10+) of Selandrinae ; Cladiuchini

(*Cladiucha* c. 23), Fenusini (9-12), and certain *Tenthredo* (8-7) of Tenthredinini of Tenthredininae; and *Decanematus* (10) of Nematini of Nematinae.

On the other hand the Heterarthrini (10-15) and Athaliini (10-21) do not seem to be related to any 9-segmented stock and are probably descended directly from stock in which the number of antennal segments had not become fixed and correlated with other characters.

The antennae of the Athaliini are further discussed in section 8 (c) below.

8. TAXONOMIC CHARACTERS

Most of the characters used below in the taxonomic part are adequately explained there but a few supplementary generalizations are included here. All the parts of the insects figured are orientated, when in dorsal or ventral view, on the assumption that the insect had its head at the top of the page and apex of the abdomen at the bottom, or when in lateral view it is always the left side as though the head were to the left of the page.

(a) Colour-pattern

The significance of the Athaliine colour-pattern—black head and thorax, yellow abdomen and yellow legs with black rings at the joints—is not known but it is a common sawfly colour-pattern occurring in most of the tribes and subfamilies of most of the families as well of course in many other orders of insects.

There are several parallel variations of this general colour-pattern in *Athalia*. There are, for example, the dark-winged forms that occur in warm humid regions such as the mountains of tropical Africa, the Eastern Himalayas and Japan. In the Himalayas this infuscation has become characteristic of two complexes of the *rosae*-group centred there; the *lugens*- and the *nigromaculata*-complexes. Of these the species *A. lugens* has spread to Western Europe.

Between the West/East Eurasian species-pairs *A. cordata* and *A. kashmirensis* the main differences are the heavily infuscated wings and legs of the latter. In the African *vollenhoveni*-group, however, the tibiae and tarsomeres can vary from being yellow with black apical rings to being entirely suffused with black in the self same species, e.g. *A. segregis*; but it is not known whether these differences are related to dry and wet seasons or any other simple climatic effects.

All the five species-groups occurring in Africa, whether restricted to Africa or not, consist predominantly in species with the pronotum and tegulae entirely black, a pattern occurring in only a few species of two groups in Eurasia: the *bicolor*-group and the *lugens*-complex of the *rosae*-group.

Several Eurasian species or species-complexes of different groups have a black mesonotum becoming progressively more marked with reddish-yellow towards the East and South-east of Asia, e.g.: *A. scutellariae scutellariae* and *A. scutellariae flammula*; *A. lugens lugens* and *A. lugens proxima*; *A. cordata* and *A. kashmirensis*. In Africa, species with a yellow-marked mesonotum occur in the drier parts such as Somaliland, Sudan and South-West Africa, as well as in the hot coastal belt of the Indian Ocean.

The differences in pattern between the front, middle and hind pairs of legs are sometimes valuable taxonomic characters. I have, for example, examined thousands of specimens of *A. cordata* and *A. circularis* and have confirmed that the former invariably have dark-ringed front tibiae and that in the latter the tibiae are at the very most slightly brownish-tipped. In contrast to this the colour-pattern of the underthorax can often show a wide range; in *A. circularis* this can be entirely yellow, yellow with a dark sterno-pleural line more or less developed, to entirely black.

(b) *Clypeus*

The most obvious and therefore practicable characters for distinguishing genera and species of *Athalia* are in the head, and in the head the clypeus shows the greatest range of useful characters. These are illustrated in Text-figs. 8–20. The curious asymmetrical clypeus in the African *furvipennis*-group (Text-fig. 17) is less evident in those species in which the clypeus is elongate (Text-figs. 15–16).

(c) *Antenna*

As mentioned in Section 7, the Athaliini appear to have been descended from ancestors with multisegmented antenna and not from the stock from which the three main subfamilies of Tenthredinidae arose, with 9-segmented antennae. The Athaliini also show a progressive reduction in antennal segments from the 18–21 of *Hennedyia* and *Hennedyella* to the 10–13 of *Hypsathalia* and *Athalia*. In the ♂ *Hennedyia* and ♀ *Hennedyella* (♂ unknown) the antenna tapers from base to apex and the apical segments are longer than broad; contraction has not yet begun. In ♀ *Hennedyia* and in *Athalia* there is a progressive contraction of the antenna with a shortening and fusion of the apical segments to form a small club (cf. Text-figs. 3–7).

The shortening of the antenna has progressed furthest in some of the Mediterranean and steppe species of the *glabricollis*- and *bicolor*-groups and is correlated with a shortening of the tibial spurs.

In the *bicolor*-group the antennae are placed much further apart than in the other groups and closer to the eyes (cf. Text-fig. 10). But because of the sexual differences in the size of the eyes the distance between the antennal sockets is better measured in relation to the transverse diameter of a socket. The distance between the sockets has also been used as a standard with which to compare the length of the malar space (see Section 8 (e), below) in closely-related species.

(d) *Labium*

Long-tongued species occur in three different groups of *Athalia*. The length of the tongue is a good specific character, but does not necessarily show phylogenetic relationships between species. It presumably indicates a habit of feeding from flowers, perhaps Labiatae, with deep-set nectaries. For practical purposes the measure used in the keys has been the length of the prelabium (i.e. the labium without its reflexed basal portion) compared to the greatest measure of a compound eye; this ratio will show slight sexual differences because males have comparatively larger eyes than females (Text-figs. 21–22).

(e) *Malar Space*

The malar space, or shortest distance between the base of the mandible and the edge of the nearest compound eye, is a useful character for distinguishing especially the females of certain closely-related species of *Athalia* (Text-figs. 8–20). The character is usually measured in relation to some other part of the insect not correlated with it in size. The distance between the antennal sockets has been used frequently for comparison with the longer malar spaces, but in the males with their almost linear malar spaces the length is measured in terms of diameters of compound eye facets (Text-figs. 14 and 16).

(f) *Pubescence*

Pubescence in *Athalia* shows differences in the quality of the pile or in its distribution. In the *bicolor*-group, for example, the head above and the thorax are uniformly covered with a fine, dense, close pile which distinguishes the group from all others. Several species are characterized by the presence of glabrous areas such as on the clypeus in *A. cordata* and *A. kashmirensis*, and on the mesonotal lobes in several of the *glabricollis*-group. In *A. himantopus* a glabrous patch each side of the mesosternum is present only in the female in the Ethiopian and tropical African races, but is absent in all the males and in the female of the South African race.

(g) *Male Genitalia*

Studies in the male genitalia show slight but evident differences between species in the form of the penis-valves. In those so far studied the differences are not of much value because they are vastly inferior to gross external differences between the species concerned.

(h) *Female Hypopygium*

The range in the form of the female hypopygia is shown in Text-figs. 24–43. These figures were mainly drawn from dissections and it should be pointed out that in dried undissected specimens the form of the hypopygium is often much distorted and partly covered by the surrounding sclerites.

(i) *Female Saw*

A few closely-related species can be readily told from each other by gross differences in the shape of the lower marginal teeth. The range is depicted in Text-figs. 44–55. The prominent, sharply pointed type of tooth which I have referred to as “dog teeth” occur in ten species of three different species-groups (Text-figs. 52–55); they do not necessarily indicate close relationship and any special significance they may have in oviposition has not been investigated.

(j) *Tibial Spurs*

Very short tibial spurs are characteristic of the *bicolor*- and *glabricollis*-groups (cf. Text-figs. 56 and 57), and are associated with short antennae. Exceptionally long

spurs occur in *A. armata* of the *furvipennis*-group (Text-fig. 58). The inner and outer spur of the front, middle and hind legs of male and female can each be of a different length: the inner spur of the hind tibia is therefore taken as the standard spur for comparison between species.

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10. CHECK LIST OF SPECIES OF ATHALIINI

Hennedyia annulitarsis Cameron, Gibraltar.

Hennedyella athaloides Forsius, Burma.

Hypsathalia przewalskyi (Jakovlev) Himalayas and Tiber.

Athalia (Group of *scutellariae*):

A. scutellariae scutellariae Cameron, Europe (= *galericulatae* Kontuniemi).

A. scutellariae flammula Zhelochovtsev, East Asia.

A. cuspidata Benson, Palestine.

A. dimidiata Konow, Asia Minor.

Athalia (Group of *bicolor*):

A. bicolor Lepeletier, Western Palaearctic (= *annulata* Fabricius, *richardi* Lep.).

A. rufoscutellata Mocsáry, Western Palaearctic (= *maritima* Kirby).

A. maculata Mocsáry, Western Palaearctic.

A. paveli Mocsáry, Western Palaearctic.

A. decorata Konow, Eastern Asia.

Athalia (Group of *glabricollis*) :

A. abyssinica Forsius, East Africa.

A. incomta Konow Central and South Africa (= *bicolor* Sauss, *laevigata* Mocsáry).

A. nigriceps Konow, Sudan, etc.

A. brevicornis Benson, South Africa.

A. glabricollis glabricollis Thomson, West and Central Europe.

A. glabricollis meridiana Benson, Eastern Mediterranean.

A. turneri Forsius, South-West Africa.

A. zanzibarica Forsius, East African Coast.

A. ahngerii Kujev, South-western Asia.

Athalia (Group of *cordata*) :

A. circularis circularis Fabricius, Western Palaearctic (= *lineolata* Lepeletier ; *bolivari* Dusmet, *cordatoides* Kontuniemi, *longifoliae* Kontuniemi).

A. circularis melanoptera Benson, Eastern Palaearctic.

A. xantha Benson, Africa.

A. scioensis Gribodo, Africa (= *fumosa* Gribodo).

A. concors Konow, Africa (= *similis* Mocsáry, *erythraspides* Enslin).

A. hummeli Benson, China.

A. picta Benson, China.

A. indiana Benson, India.

A. cordata Lepeletier, Western Palaearctic (= *blanchardi* Brullé).

A. kashmirensis (Benson), East Asia (= *veronicae* Takeuchi).

Athalia (Group of *rosae*) :

A. antennata Cameron, India.

A. rosae rosae (L.) Western Palaearctic (= *colibri* Christ, *spinarum* Fabricius, & *centifoliae* Panzer).

A. rosae ruficornis (Jakovlev), East Asia (= *leucostoma* Cameron, *japanensis* Rohwer).

A. malagassa Saussure, Madagascar.

A. paradoxa Konow, Central Europe.

A. cornubiae Benson, Western Palaearctic.

A. liberta liberta (Klug), Western Palaearctic (= *ancilla* Lepeletier).

A. liberti yanoi Takeuchi, Eastern Palaearctic.

A. sikkimensis (Benson), North India.

A. nigromaculata Cameron, North India.

A. japonica (Klug), East Asia (= *nigrinotum* Matsumura & *novittata* Kokujev).

A. lugens lugens (Klug), Western Palaearctic.

A. lugens infumata (Marlatt) Japan.

A. lugens proxima (Klug), East Asia (= *tibialis* Cameron, *orientalis* Cam., *funnebris* Forsius, *kuroiwae* Matsumura & Uchida, *camtschatica* Forsius and *tristis* Forsius).

A. birmanica Benson, Burma.

- A. kansuensis* (Benson), China.
A. scapulata Konow, Oriental.
Athalia (Group of *furvipennis*) :
A. schoutedeni Forsius, Central Africa.
A. dulcis Benson, Central Africa.
A. dissona Konow, Central Africa.
A. limpopo Benson, South-east Africa.
A. pullicoma Konow, Africa.
A. clavata Konow, Africa.
A. mellis Benson, Africa.
A. pluto Benson.
A. ustipennis Mocsáry, Africa (= *mashonensis* Enslin).
A. cerberus Benson, Central Africa.
A. furvipennis Mocsáry, Africa (= *flacca* Konow).
A. umbrosa Benson, East Africa.
A. armata Benson, Central Africa.
A. nigripes Enslin, Central Africa.
A. asbolos Benson, Central Africa.
A. pulla Benson, Central Africa.
Athalia (Group of *himantopus*) :
A. himantopus truncata (Enslin), Central and East Africa.
A. himantopus obsoleta Benson, Ethiopia.
A. himantopus himantopus Konow, South Africa.
Athalia (Group of *vollenhoveni*) :
A. guillarmodi Benson, South Africa.
A. sjoestedti Konow, Central and East Africa (= *infumata* Mocsáry & *marginipennis* Enderlein).
A. vollenhoveni Gribodo, East Africa.
A. segregis Konow, Central and East Africa (= *melanopoda* Enslin).
A. fuscata Benson, East Africa.
A. schweinfurthi schweinfurthi Konow, Arabia and Ethiopia.
A. schweinfurthi atripennis Benson, East Africa.

II. ATHALIINI (TENTHREDININAE)

Antenna with 10 or more segments ; flagellum subclavate (except in *Hennedyella* and the ♂ of *Hennedyia*) with the subapical segments broader than long. Head without post-genal carina. Eyes $\pm$ converging in front (except in *Hypsathalia*) ; more strongly in ♂ than ♀ (except ? in *Hennedyia*). Mesepisternum (Text-fig. 1) with upper half convex and rounded ; mesopleural suture Z-shaped. Wings of generalized Tenthredinid type (Text-fig. 2) : *C* and *Sc* + *R* in fore wing are so swollen as almost to obliterate cell *C* ; *M* arises from *Rs* + *M* after the latter has left *Sc* + *R* (except in *Hennedyia*) ; anal cell complete with oblique cross-vein ; hind wing with 2 enclosed medial cells. Inner front tibial spur simple. Length 5–8.5 mm.

Colour pattern characteristically with yellow body, and head and mesonotum mainly black, legs normally yellow with tibia and tarsi black-ringed apically, though the black may disappear from the front and middle legs, or spread so as to suffuse all the legs.

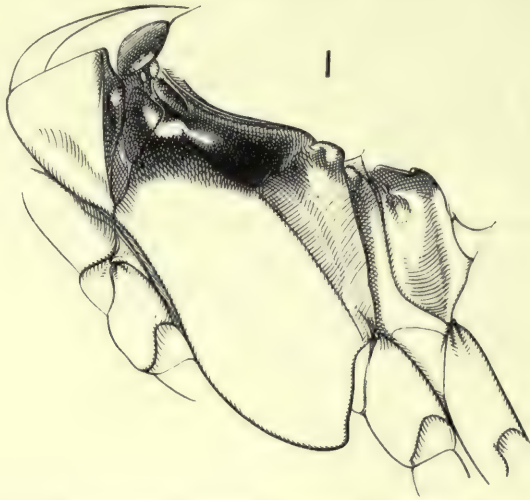
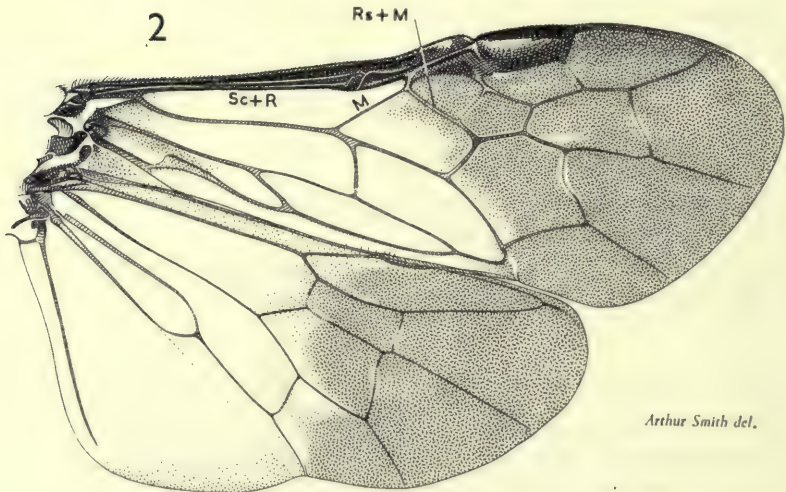


FIG. 1. Left lateral view of thorax of *Athalia sjoestedti*.



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FIG. 2. Right pair of wings of *Athalia sjoestedti*.

Wings are often $\pm$ infusate apically (Text-fig. 2) or all over ; and the stigma and most of the venation are piceous.

This tribe is divided into four genera (three monotypic and the other with 61 species and 10 subspecies). They are distributed over most of Africa, Europe and Asia. The larvae, so far as is known, are attached to herbaceous dicotyledonous

flowering plants and include several that are destructive to cultivated Cruciferae throughout their range.

The correlation of two primitive characters [(1) the antenna being more than 9-segmented and (2) the origin of *M* in the fore wing usually from *Rs* + *M* after the latter has left *Sc* + *R*] with a unique form of mesopleura justifies the treatment of this group of genera as forming at least a distinct tribe of the Tenthredininae, and possibly as a distinct subfamily.

An asterisk * before a species-name below indicates that the author has examined the type of it during these studies.

12. KEY TO GENERA

- 1 Antenna 18- to 21-segmented, with the flagellum either subclavate (Text-fig. 6) or tapering from base (Text-fig. 7), and with the two basal segments either transverse or longer than broad. Tarsal claws with small inner tooth. Clypeus subtruncate, scarcely longer medially than distance between antennal sockets 2
- Antennae 10- to 13-segmented, with the flagellum subclavate, and with the two basal segments longer than broad (Text-figs. 3-5). Tarsal claws simple or with inner tooth. Clypeus emarginate, subtruncate or produced in front, often longer medially than distance between antennal sockets 3
- 2 (1) Antenna 20- or 21-segmented with two basal segments transverse; flagellum tapering apically in ♂ (Text-fig. 7), but subclavate in ♀, with segments beyond 12th transverse (Text-fig. 6). *M* of fore wing joins *Rs* + *M* after the latter has left *Sc* + *R*.
 One species, *H. annulitarsis* Cameron, from Gibraltar **HENNEDYIA** Cameron
- Antenna 18-segmented with two basal segments longer than broad and flagellum in ♀ tapering from base. *M* of fore wing joins *Sc* + *R* slightly before the origin of *Rs* + *M*.
 One species, *H. athaloides* Forsius, from Burma **HENNEDYELLA** Forsius
- 3 (1) Eyes converge noticeably in front where they are at most scarcely further apart than the length of an eye in ♀ (Text-figs. 9-13, 15 and 16, 18-20) and in ♂ (Text-figs. 14 and 17) usually much closer than the length of an eye; and their lower margins are far below the antennal sockets. Malar space at its most not longer than distance between antennal sockets.
 61 spp. + 10 subspp. Africa, Europe and Asia **ATHALIA** Leach
- Eyes subparallel and small so that they are only about two-thirds as long as their distance apart in front (Text-fig. 8); and their lower margins are almost in a straight line with the lower margin of the antennal sockets. Malar space longer than distance between antennal sockets. Mandibles stout so that their medial breadth is about the same as the basal breadth of the labrum.
 One species, *Athalia przewalskyi* Jakovlev, from the mountains of Central Asia **HYPSPATHALIA** gen. nov.

13. Genus **HENNEDYIA** Cameron

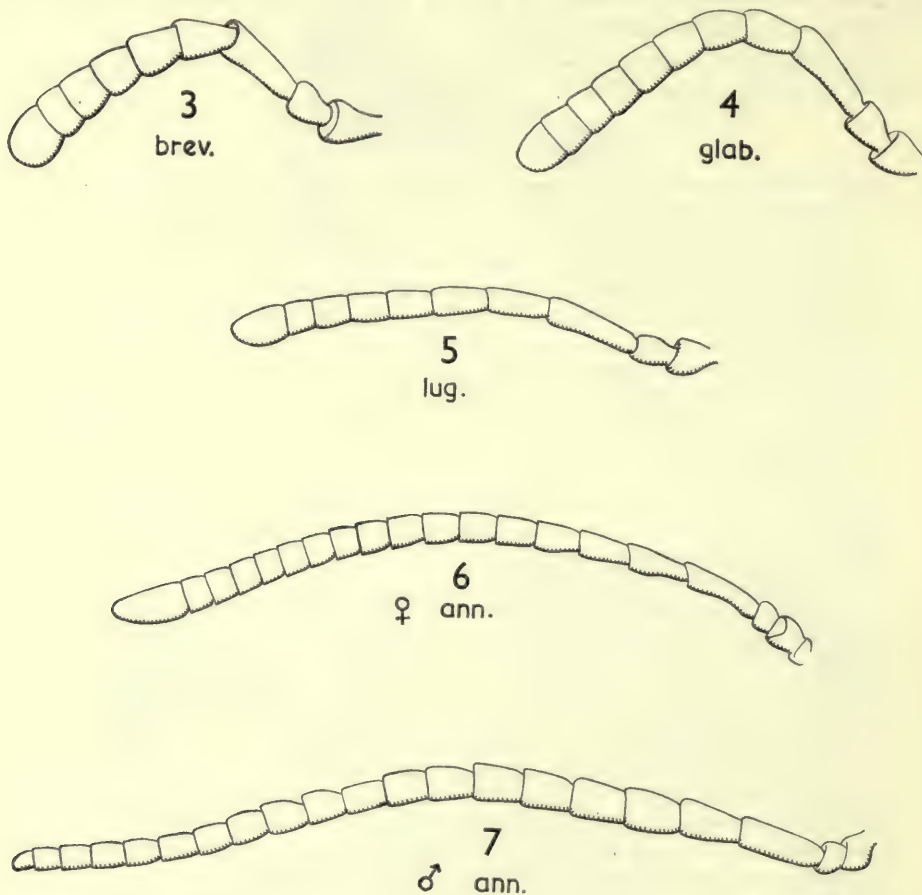
Cameron, P., 1891, *Mem. & Proc. Manchester Lit. Phil. Soc.* **4** (4): 9. Monotypic.

H. annulitarsis Cameron

**Hennedyia annulitarsis* Cameron, P., 1891, *loc. cit.*

Head and thorax black except for mouthparts, clypeus, pronotum, and tegulae which are brown, and the legs which are brown, apart from the black apices of the

hind tibiae and apices of all the tarsomeres. Wings slightly infusate; *cu-a* of fore wing received on cell *1M* much closer to vein *M* than to *1m-cu*. Head with hind ocelli further apart than from back of head; POL : OOL as 1.0 : 0.75. Thorax uniformly pubescent. Sawsheath as long as the two basal tarsomeres and half the 3rd. ♀ hypopygium entire behind. Saw as in Text-fig. 50. Length 5 mm.



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FIGS. 3-7. Left side of antenna in : 3, *Athalia brevicornis* ♀; 4, *A. glabricollis* ♀; 5, *A. lugens* ♀; 6, *Hennedyia annulitarsis* ♀; 7, *H. annulitarsis* ♂.

In addition to the unique male type of this species collected near Gibraltar¹ by J. J. Walker and now in the British Museum, I have found in the Bavarian State Collections, Munich, one female which may belong to the same species. Unfortunately it has no locality label unless the four-pointed pink star on its pin has some

¹ According to his diaries now belonging to the Royal Entomological Society, London, Commander J. J. Walker collected numerous insects, mainly Coleoptera but also Hymenoptera, near Gibraltar when he was stationed there in H.M.S. *Grappler* from October, 1886 to April, 1889.

such significance unknown to Dr. Kühlnhorn. Apart from sexual differences the male and female differ as follows :

- ♂ Antenna 21-segmented, tapering from base to apex with no flagellar segment transverse (Text-fig. 6). Malar space almost one-third (0.3 : 1.0) distance between antennal sockets.
- ♀ Antenna 20-segmented with flagellum subclavate, the segments beyond the 12th being transverse (Text-fig. 7). Malar space only about as long as the diameter of one eye facet.

This kind of antennal difference between the sexes is not unusual in Hymenoptera, but, apart from the *picta* group of *Rhogogaster*, I am unaware of any other sawfly in which the male malar space exceeds that of the female. It seems not unlikely therefore that this male and this female may belong to different species.

14. Genus *HENNEDYELLA* Forsius

Forsius, R., 1935, *Notul. ent. Helsingf.* **15** : 57-59. Monotypic.

H. athaloides Forsius

**Hennedyella athaloides* Forsius, R., 1935, *loc. cit.*

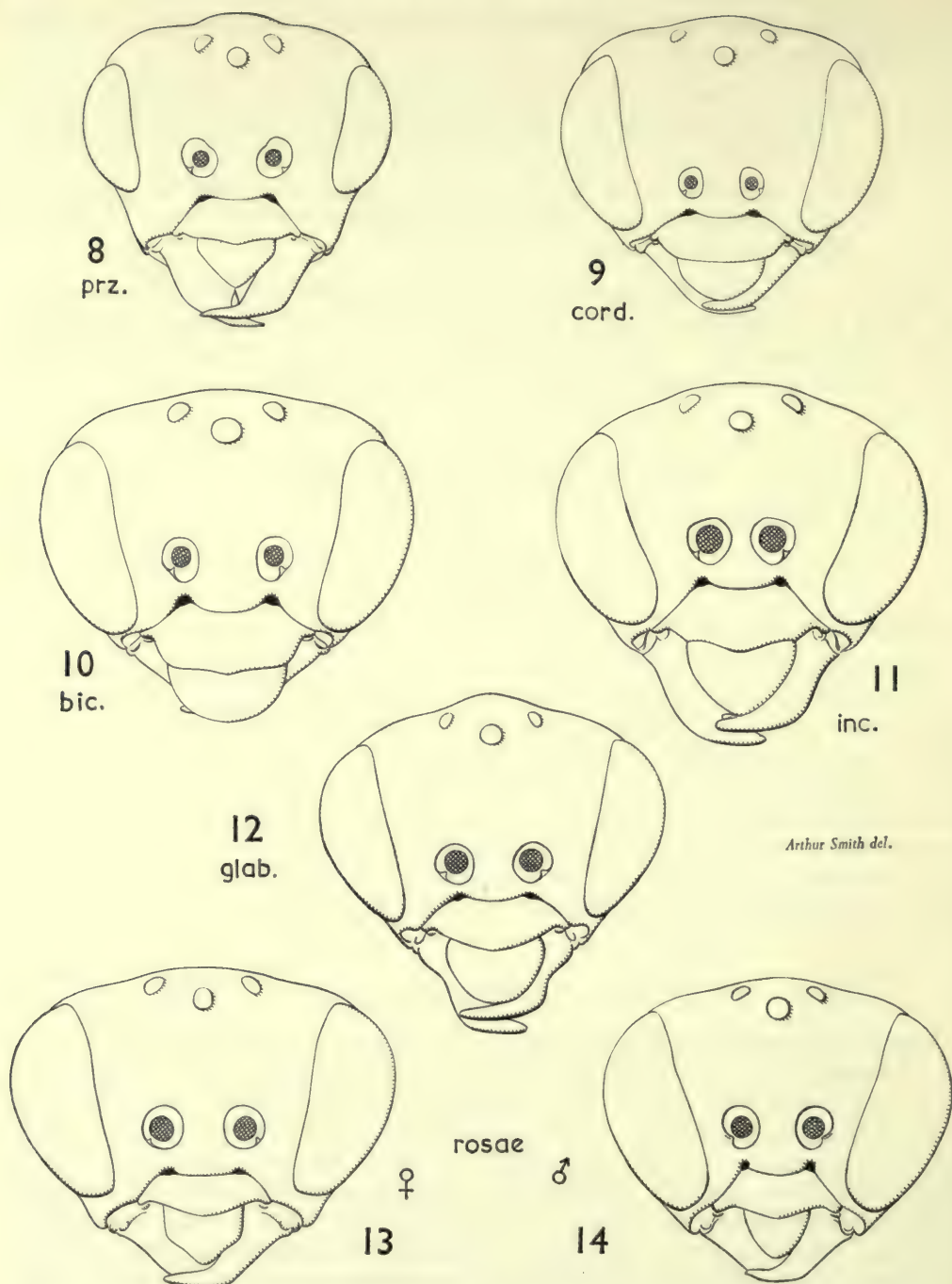
Yellow with the following parts black : antenna, head above clypeus, mesonotum except on the sloping sides and in the sutures which are $\pm$ yellow, raised part of metanotum, convex upper part of mesepimeron, tibiae and tarsi of all legs. Wings subhyaline ; front half of stigma black, rest of venation piceous to brown. Vein *cu-a* of fore wing received in middle of cell *1M* ; hind ocelli closer together than from back of head ; POL : OOL as 1.0 : 1.5. Thorax uniformly pubescent. Hypopygium entire behind. Sawsheath only as long as hind metatarsus. Length 6.5 mm.

Only known from the unique type specimen in Gribodo's collection in the Museo Civico di Genova labelled " Pulu Laut, Borneo ", but, according to Forsius, really from Burma.

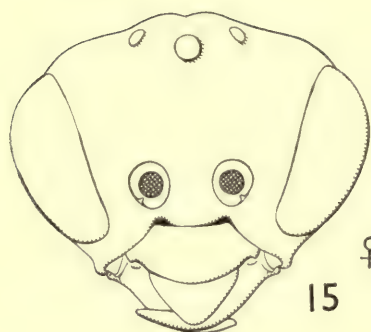
15. Genus *HYPSATHALIA* nov.

Very broad species. Antennae 10-11 segmented, only about as long as width of head behind eyes, segments beyond 6th transverse. Eyes subparallel in front and very small so that they are only about two-thirds as long as their distance apart in front. Lower margin of eyes and antennal sockets almost in a straight line. Malar space longer than distance between antennal sockets. Mandibles stout so that their medial breadth is about the same as the basal breadth of the labrum (Text-fig. 8). Clypeus slightly produced medially. Fore wing with *M* and *1m-cu* converging towards stigma ; *cu-a* received on cell *1M* at about one-third from its base. Tibial spurs long and unmodified ; the inner spur on the hind tibia longer than the apical breadth of the tibia. Length 5-6 mm. Mountains of C. Asia.

Type species *Athalia przevalskyi* Jakovlev.



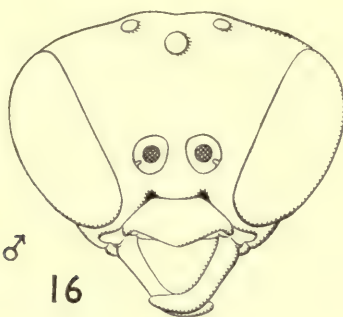
FIGS. 8-20. Face without antennae in: 8, *Hypsathalia przewalskyi* ♀; 9, *Athalia cordata* ♀; 10, *A. bicolor* ♀; 11, *A. incomta* ♀; 12, *A. glabricollis* ♀; 13, *A. rosea* ♀; 14, *A. rosae* ♂; 15, *A. mellis* ♀; 16, *A. mellis* ♀; 17, *A. furvipennis* ♂; 18, *A. himantopus* ♀; 19, *A. vollenhoveni* ♀; 20, *A. schweinfurthi* ♀.



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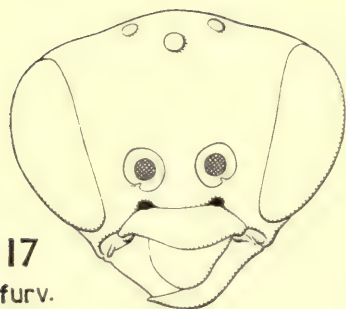
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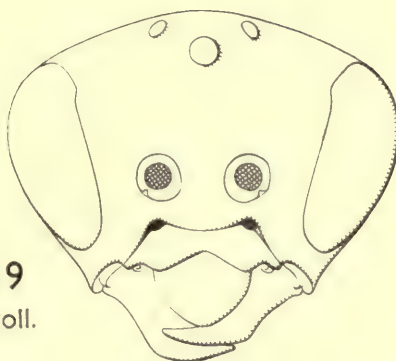
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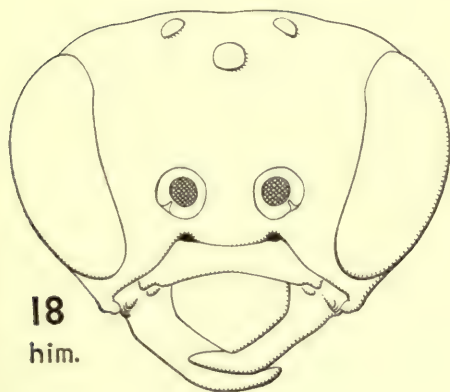
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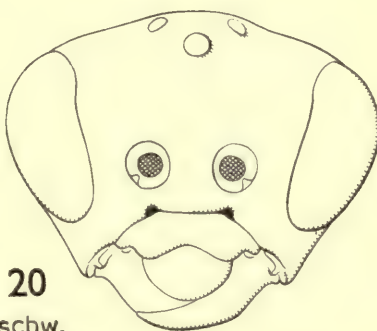
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H. przewalskyi (Jakovlev)

Athalia przewalskyi Jakovlev, A., 1887, *Horae Soc. ent. ross.* **21** : 16.

Head black above and yellow below antennae. Pronotum and mesonotum yellow with a black fleck in the middle of the front lobes and on the side of each lateral lobe. Metanotum and underthorax black except for the centre of the mesosternum. Wings subinfusate; stigma and venation black. Legs yellow with black coxae and apices of all tibiae and tarsomeres. Abdomen yellow except for the following which are black: 1st, 2nd and $\pm$ 3rd tergite entirely and a fleck on each lateral edge of the 4th–7th tergites and the sawsheath. ♀ hypopygium (Text-fig. 31). Saw with shallow teeth (cf. Text-fig. 45).

Mountain tundra of Central Asia, 14,000–16,000 ft.: Amne-Machen Shan (Burkham-Budda) in Tsinghai, W. China; and Himalayas in Tibet, India and Kashmir.

16. Genus *ATHALIA* Leach

Athalia Leach, W., 1817, *Zool. Misc.* **3** : 128. Type species: (*Tenthredo spinarum* Fabricius) = *Tenthredo rosae* L.

Dentathalia Benson, R. B., 1931, *Ent. mon. Mag.* **67** : 111. Type species: *Athalia scutellariae* Cameron.

- | | | |
|-------|---|---|
| 1 | Tarsal claws simple | 2 |
| – | Tarsal claws with inner tooth in addition to end tooth. Clypeus with sinuate front margin. | |
| | Three spp. Eurasia (Labiatae) i. Group of <i>scutellariae</i> | |
| 2 (1) | Tibial spurs very short (inner hind spur at most less than three-quarters apical width of tibia) (Text-fig. 57). Antenna with 7th or even 6th segment broader than long (Text-figs. 3 and 4), and often with distance between antennal sockets in ♀ greater than diameter of a socket (Text-fig. 10) | 3 |
| – | Tibial spurs longer (inner hind spur at least as long as apical width of tibia) (Text-figs. 56 and 58). Antenna with only 8th or 9th and following segments broader than long (Text-fig. 5). Distance between antennal sockets usually less than diameter of socket (Text-figs. 13–20) | 4 |
| 3 (2) | Antennae set far apart so that the distance between the sockets is greater than the diameter of a socket (Text-fig. 10). Front margin of clypeus each side with an angle that separates off a lateral margin more than half as long as diameter of antennal socket. | |
| | Five Eurasian spp. ii. Group of <i>bicolor</i> | |
| – | Antennae closer together so that the distance between the sockets is less than the diameter of a socket (Text-figs. 11 and 12). Clypeus not angled each side or the angle is so close to the anterior mandibular articulation that the lateral portion of the clypeus is not more than half diameter of an antennal socket. | |
| | Two W. Palaearctic and 5 African species (Cruciferae) iii. Group of <i>glabricollis</i> | |
| 4 (2) | Clypeus longer medially than distance between antennal sockets, and angled, rounded, or subtruncate in front (Text-figs. 13–17) | 5 |
| – | Clypeus shorter medially than distance between antennal sockets and excised, emarginate, or truncate in front (Text-figs. 18–20) | 7 |
| 5 (4) | Clypeal front margin not angled each side or the angle is so close to the mandibular articulation that the lateral part of the front margin is shorter than half the diameter of an antennal socket (Text-figs. 13–17) | 6 |

Front margin of clypeus each side with an angle that separates off (between the angle and the mandibular articulation) a lateral margin more than half as long as the diameter of an antennal socket (Text-fig. 9).

Six Eurasian and 3 African species (Labiatae, Scrophulariaceae, etc.)

iv. Group of *cordata*

- (5) Clypeus almost symmetrical and only slightly rounded in front (Text-figs. 13 and 14). Prelabium always shorter than greatest measure of eye (Text-fig. 21). Pronotum pale except in 3 dark-legged species from SE. Asia (which have very slender antennae with the flagellum no broader than the 2nd segment). Dealt with in two sections: (a) *lugens-nigromaculata* with 7 spp.; and (b) *rosae-liberta* with 6 spp.

Twelve Eurasian species and one in Madagascar (Cruciferae and Crassulaceae)

v. Group of *rosae*

- Clypeus clearly asymmetrical (Text-fig. 17) or $\pm$ angularly produced medially in front (Text-figs. 15 and 16). Prelabium often as long or longer than greatest measure of eye (Text-fig. 22). Pronotum often black but then flagellum broader than 2nd antennal segment. Dealt with in three complexes: (a) *dissona* with 4 spp.; (b) *furvipennis* with 8 spp.; and (c) *nigripes* with 4 spp. Sixteen African species (Cruciferae and ? Labiatae)

vi. Group of *furvipennis*

- (4) Clypeus very short and truncate in front or very slightly emarginate (Text-fig. 18).

One African species (Cruciferae)

vii. Group of *himantopus*

- Clypeus excised medially in front (Text-figs. 19 and 20).

Six African species (Cruciferae)

viii. Group of *vollenhoveni*

(i) Group of *scutellariae*

Clypeus with symmetrically sinuate front margin, not angled laterally. Prelabium shorter than greatest measure of an eye. Tibial spurs long (inner hind spur at least as long as apical width of tibia). ♀ hypopygium scarcely emarginate behind. Claws with inner tooth. On Labiatae (*Scutellaria*).

- 1 Mesosternum yellow. Mesonotum densely pubescent all over. Tibial spur normal (inner hind tibial spur more than three-quarters as long as apical breadth of tibia and about five times as long as broad). Saw with less prominent teeth (Text-fig. 51).

[Antenna with only segments 8 or 9 onwards transverse]

2

- Underthorax with at least mesosternum black. Mesonotum sparsely pubescent and subglabrous behind. Tibial spur very stout and short (inner hind tibial spur only about three times longer than broad and two-thirds as long as apical breadth of hind tibia). Saw with very prominent teeth (Text-fig. 52)

3

- (1) Pro- and mesothorax entirely yellow. 5-5.5 mm.

[East Siberia] ♂♀ *scutellariae flammula* (Zhelochovtsev)

- Mesonotum at least partly black (in the darkest forms entirely black; in the lightest forms with the scutellum and sides of front and lateral lobes yellow); and on the underthorax the mesepimeron may be $\pm$ black. 4.5-6 mm.

[Larvae on *Scutellaria galericulata* L., and *minor* L. Europe and West Asia (Fergan Mountains, Kirghiz)] ♂♀ *scutellariae scutellariae* Cameron

- (1) Antenna with 6th and following segments broader than long. Thorax including tegula yellow with black flecks on the fore lobes and posteriorly on the lateral mesonotal lobes, the mesosternum, $\pm$ mesepimeron and $\pm$ the metanotum; 1st tergite with only a medial black fleck. 6-7 mm.

[Palestine] ♂♀ *cuspidata* Benson

- Antenna with only 9th and following segments broader than long. Thorax entirely black together with tegula and 1st tergite. 5–6 mm.
[Transcaucasia] ♂♀ *dimidiata* Konow

Athalia scutellariae scutellariae Cameron

- **Athalia scutellariae* Cameron, P., 1880, *Ent. mon. Mag.* **17** : 66.
Dentathalia scutellariae (Cameron) Benson, R. B., 1931, *Ent. mon. Mag.* **67** : 111.
 Dentathalia galericulatae* Kontuniemi, T., 1951, *Acta ent. fenn.* **9 : 44.
Athalia scutellariae scutellariae Cameron, Benson, 1954, *Bull. Brit. Mus. (Nat. Hist.) Ent.* **3** (7) : 278.
 Larva : Lorenz, H. & Kraus, M., 1957, *Abh. Larvalsyst. Insekt.* **1** : 89.

Athalia scutellariae flammula Zhelochovtsev

- Athalia flammula* Zhelochovtsev, 1927, *Ent. Mitt.* **16** : 82.
Athalia scutellariae flammula Zhelochovtsev, Benson, 1954, *Bull. Brit. Mus. (Nat. Hist.) Ent.* **3** (7) : 278.

Athalia cuspidata Benson

- **Athalia cuspidata* Benson, 1954, *Bull. Brit. Mus. (Nat. Hist.) Ent.* **3** (7) : 277–278.

Athalia dimidiata Konow

- **Athalia dimidiata* Konow, 1891, *Wien. ent. Ztg.* **10** : 42.

(ii) Group of *bicolor*

Front margin of clypeus each side with an angle that separates off a lateral margin more than half as long as the diameter of an antennal socket (Text-fig. 10). Antenna with 7th or even 6th and following segments broader than long (cf. Text-fig. 4). Prelabium longer than greatest measure of an eye (Text-fig. 22). Antennal sockets further apart than diameter of a socket (Text-fig. 10). Head and thorax with dense short pile. Tibial spurs short (inner hind tibial spur not more than two-thirds apical width of tibia) (Text-fig. 57). Claws simple. Hypopygium of ♀ at most slightly emarginate each side of middle (Text-fig. 32).

- | | | |
|-------|---|---|
| 1 | Clypeus truncate in front and medially about as long as the distance between the antennal sockets | 2 |
| — | Clypeus produced in front and medially at least one and a quarter times as long as the distance between the antennal sockets (Text-fig. 10).
[Prelabium longer than greatest measure of eye. 1st tergite black and most of thorax (except tegula and in ♀ also ± prothorax which are yellow). Head and thorax dull with very fine sculpture and pubescence brownish on mesonotum. Inner hind tibial spur only about half as long as apical width of tibia (Text-fig. 57). Saw as in Text-fig. 51. 5–7 mm. Adults at flowers of <i>Ranunculus</i> (? foodplant). Europe, Mediterranean, Asia Minor, Transcaucasia to Turkmen Republic ♂♀ <i>bicolor</i> Lepelletier | |
| 2 (1) | Thorax including tegula black. Prelabium longer than greatest measure of eye | 3 |
| — | Thorax with at least edge of pronotum and apex of pronotum and apex of tegula yellow. Prelabium longer or shorter than eye | 4 |

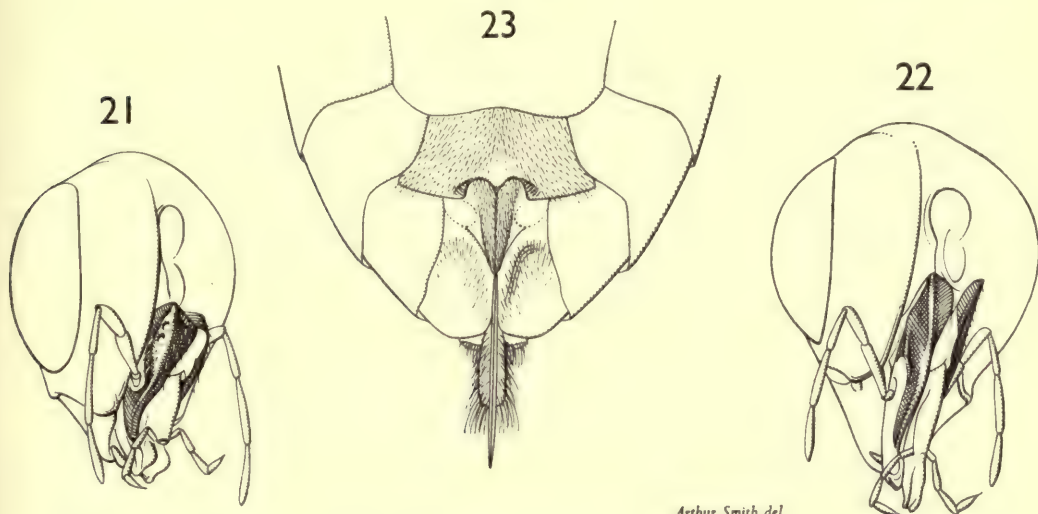
- 3 (2) Antenna only with 7th segment onwards broader than long and the 8th is only about one and a half times as broad as long. Saw as in Text-fig. 46. 5-6 mm.

[Hungary and South-East Europe, Asia Minor and Transcaucasia]

♂♀ *maculata* Mocsáry

- Antenna strongly clubbed with 5th segment onwards broader than long and the 8th is about twice as broad as long. Saw as in Text-fig. 51. 5-6 mm.

[Asia Minor] ♂♀ *paveli* Mocsáry



Arthur Smith del.

FIGS. 21-22. Head in left posteriolateral view to show length of tongue (prelabium) compared to length of eye in : 21, *Athalia rosae* ♀ ; 22, *A. glabricollis* ♀.

FIG. 23. Apex of abdomen below to show position of hypopygium (last ventral sternite) in *Athalia rosae* ♀.

- 4 (2) Mesonotum with at least lateral lobes entirely yellow. Middle tibia ± darkened apically. Saw as in Text-fig. 51. 5-6 mm.

[East Siberia (Irkutsk and Amur)]. ♂♀ *decorata* Konow

- Mesonotum with at least front and lateral lobes entirely black. Middle tibia pale apically. Saw as in Text-fig. 45. 5-6 mm.

[Central and South-East Europe, Asia Minor and Transcaucasia]

♂♀ *rufoscutellata* Mocsáry

Athalia bicolor Lepeletier

Tenthredo annulata Fabricius, 1787, *Mant. Insect.* 1 : 253 *nec.* Geoffroy, 1785.

Athalia bicolor Lepeletier, 1823, *Mon. Tenth.* : 23.

Athalia richardi Lepeletier, 1823, *Mon. Tenth.* : 23.

Athalia maculata Mocsáry

**Athalia maculata* Mocsáry, 1879, *Természetr. Fü.* 3 : 117.

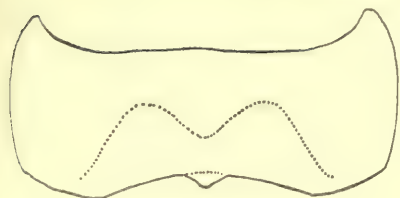
Athalia paveli Mocsáry

**Athalia paveli* Mocsáry, 1879, *Természetr. Fü.* 3 : 117.

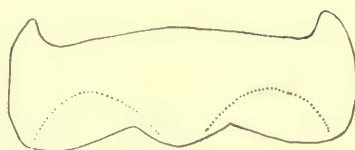
Athalia rufoscutellata Mocsáry*Athalia rufoscutellata* Mocsáry, 1879, *Természetr. Füzet.* 3 : 116.**Athalia maritima* W. F. Kirby, 1884, *Ent. mon. Mag.* 20 : 215.*Athalia decorata* Konow**Athalia decorata* Konow, 1900, *Ent. Nachr.* 26 : 120.(iii) Group of *glabricollis*

Clypeus symmetrically rounded in front (Text-fig. 12), not angled laterally, or the angle is so close to the mandibular articulation that the lateral portion of the clypeus is less than half the diameter of an antennal socket (Text-fig. 11). Prelabium sometimes longer than greatest measure of an eye (Text-fig. 22). Antenna with 7th or even 6th and following segments broader than long (Text-figs. 3 and 4). Tibial spurs short (inner hind tibial spur at most less than three-quarters apical width of tibia) (Text-fig. 57). Claws simple. On Cruciferae.

- | | | |
|-------|--|---|
| 1 | Pronotum and mesopleura mainly black | 2 |
| — | Pronotum and mesopleura mainly yellow (Saw as in Text-fig. 45) | 3 |
| 2 | Prelabium shorter than greatest measure of eye (Text-fig. 21). Tegula and costa at extreme base pale. Underthorax $\pm$ with a pale band across the mesopleura in addition to the pale mesosternum. ♀ hypopygium as in Text-fig. 24. Saw as in Text-fig. 51. 5–8 mm. | |
| | [Ethiopia, Kenya, Uganda and Tanganyika] ♂♀ <i>abyssinica</i> Forsius | |
| — | Prelabium longer than greatest measure of eye. Tegula and costa entirely black. Underthorax with mesosternum pale but mesopleura entirely black. ♀ hypopygium as in Text-fig. 31. Saw as in Text-fig. 45. 5–8 mm. | |
| | [Congo, Rhodesia, Nyasaland, Natal, Transvaal, Basutoland and Cape Province] ♂♀ <i>incomta</i> Konow | |
| 3 (2) | Mesonotum $\pm$ black. Either at least middle legs with black-tipped tibia and tarsi, or prelabium shorter than greatest measure of eye (Text-fig. 21) | 4 |
| — | Thorax, middle and front legs entirely yellow. Prelabium longer than greatest measure of eye (Text-fig. 22). 5–7 mm. | |
| | [Antenna with 7th segment onwards broader than long. ♀ hypopygium tridentate (Text-fig. 38). Saw not seen. Somaliland and Sudan] ♂♀ <i>nigriceps</i> Konow | |
| 4 (3) | Prelabium as long as or longer than greatest measure of eye (Text-fig. 22) | 5 |
| — | Prelabium shorter than greatest measure of eye (Text-fig. 21) | 6 |
| 5 (4) | Mesonotum densely pubescent all over. Front and middle legs with at most the apices of the tibiae and tarsi brownish. Wings slightly infusate apically. ♀ malar space about two ninths distance between eye-sockets. ♀ antenna (Text-fig. 3) scarcely longer than width of head (1.1 : 1.0). ♀ hypopygium excised behind (Text-fig. 37). 6–7 mm. | |
| | [Nyasaland, Rhodesia, Basutoland and Cape Province] ♂♀ <i>brevicornis</i> sp. nov. | |
| — | Mesonotum sparsely pubescent with the convex middle area of the side lobes glabrous. Front and middle legs with at least the middle tibiae and tarsi ringed with black apically. Wings subhyaline. ♀ malar space about two-sevenths distance between antennal sockets. ♀ antenna clearly longer than head width (1.2 : 1.0). ♀ hypopygium scarcely emarginate behind (Text-fig. 35). 5–7 mm. | |
| | [Subspecies <i>glabricollis</i> from Central, Western and South-western Europe, and Mediterranean North Africa, has little more than the basal half of C of fore wing yellow. | |



24 aby



29 pav.



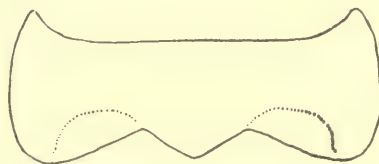
25 him.



30 schw.



26 circ.



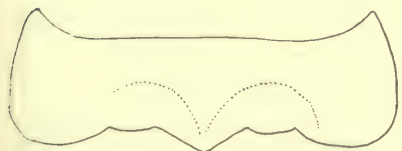
31 prz.



27 lug.



32 bic.



28 schout.

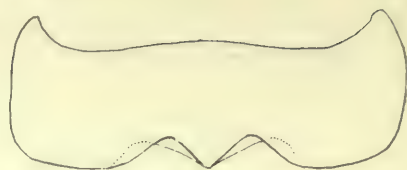


33 cord.

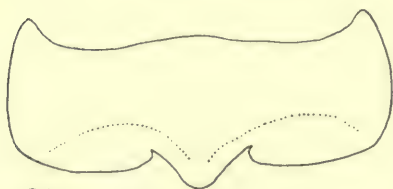
FIGS. 24-33. ♀ hypopygium in : 24, *Athalia abyssinica* ; 25, *A. himantopus* ; 26, *A. circularis* ; 27, *A. lugens* ; 28, *A. schoutedeni* ; 29, *A. pavli* ; 30, *A. schweinfurthi* ; 31, *Hypsathalia przewalskyi* ; 32, *Athalia bicolor* ; 33, *A. cordata*.



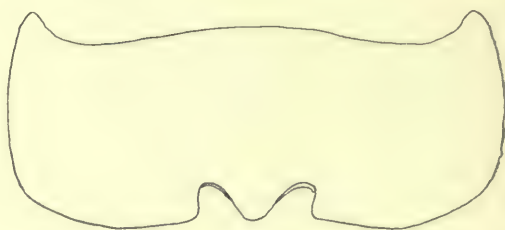
34 lib.



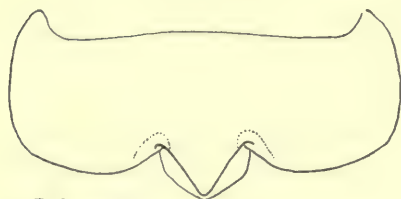
39 corn.



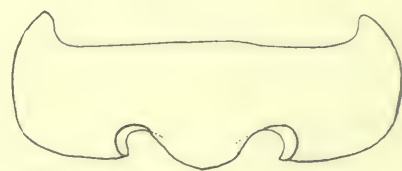
35 glab.



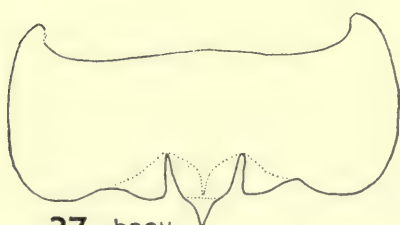
40 ros.



36 scio.



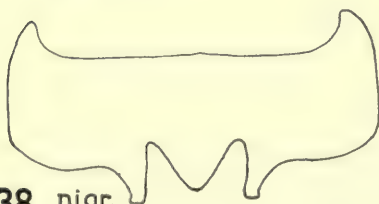
41 jap.



37 brev.



42 voll.



38 nigr.



43 par.

FIGS. 34-43. ♀ hypopygium in : 34, *Athalia liberta* ; 35, *A. glabricollis* ; 36, *A. scioensis* ; 37, *A. brevicornis* ; 38, *A. nigriceps* ; 39, *A. cornubiae* ; 40, *A. rosae* ; 41, *A. japonica* ; 42, *A. vollenhoveni* ; 43, *A. paradoxa*.

Subspecies *meridiana* Benson, which occurs in Greece, Turkey, Palestine, South-western Iran and Samarkand, has almost the basal three quarters of *C* in the fore wing yellow.

Larva on Cruciferae: *Diplotaxis tenuifolia* (L.) D.C., *Erysimum*, *Raphanus raphanistrum* L., *Sinapis alba* L., and *Sisymbrium*] ♂♀ *glabricollis* C. G. Thomson

- 6 (4) Antenna less swollen apically, with 8th segment scarcely broader than 1st. ♀ hypopygium slightly emarginate behind each side of middle (c.f. Text-fig. 32) 7

- Antenna strongly swollen apically, with 8th segment about one and a half times as broad as 1st segment. ♀ hypopygium scarcely emarginate behind.

[Mesonotum sparsely pubescent, subglabrous behind. South-West Africa]

♂♀ *turneri* Forsius

- 7 (6) Clypeus angularly produced medially where it is more than twice as long as distance between antennal sockets. Mesonotum sparingly pubescent all over, front and lateral lobes entirely black in ♀, though yellow at margins in ♂. Costa of fore wing with at most basal third yellow. Malar space in ♀ more than one-quarter distance between antennal sockets. 5-7 mm.

[Coastal species of East Africa: Kenya (Mombasa), Zanzibar and Mozambique (Inhaca Island)] ♂♀ *zanzibarica* Forsius

- Clypeus subtruncate in front and scarcely longer medially than distance between antennal sockets. Mesonotum with lobes partly glabrous and though front and lateral lobes are entirely black in ♀ they are ± yellow margined in ♂. Costa of fore wing with about basal half yellow. Malar space linear in both sexes, much less than one-quarter distance between antennal sockets. 5-7 mm.

[Species of Steppe lands of Palestine, Transcaucasia, Mesopotamia to Turkmen and Uzbek Republics] ♂♀ *ahngeri* Kujev

Athalia abyssinica Forsius

**Athalia abyssinica* Forsius, 1930, *Notul. ent. Helsingf.* 10: 67.

A. incomta Konow

Athalia bicolor Saussure, 1892 in *Distant Nat: Transvaal*: 226, nec Lepeletier.

**Athalia incomta* Konow, 1908, *Z. syst. Hym. Dipt.* 8: 168.

**Athalia laevigata* Mocsáry, 1909, *Ann. hist.-nat. Mus. hung.* 7: 12.

This species was not distinguished by Forsius (1931) from *A. mellis* Benson sp. n. (p. 375).

Athalia nigriceps Konow

**Athalia nigriceps* Konow, 1908, *Z. syst. Hym. Dipt.* 8: 165-166.

Athalia brevicornis sp. nov.

♀ *Colour* yellow with the following parts black: head above, clypeus and gena, antenna above, mesonotum (except ± scutellum behind), and ± metanotum, apical tarsal segment of front and middle legs, apex of tibia and apices of tarsal segments of hind legs. Wings yellowish basally and slightly infusate apically; stigma, costa (except ± basal third), and subcosta (except extreme base) black; rest of venation yellowish in basal part and piceous in apical part of wings. Length 6-7 mm.

Structure : Antennae 9-10 segmented, scarcely longer than width of head (Text-fig. 3) ; 7th segment onwards broader than long. Prelabium longer than greatest measure of eye as 1.2 : 1.0. Malar space about equal to the diameters of two compound eye facets, or two-ninths of distance between eye sockets (0.24 : 1.00). Hind inner apical tibial spur shorter than apical width of tibia as 0.72 : 1.00. Hypopygium almost tridentate apically (Text-fig. 37). Saw with shallow teeth (cf. Text-fig. 45).

Pubescence fairly evenly distributed over head and thorax, and pale throughout.

♂ as ♀ except for sexual characters and that the antenna is longer than head width as 1.4 : 1.0, the prelabium is scarcely longer than the eye and the malar space less than one compound eye facet.

BASUTOLAND, Maseru, 1 ♀ (Holotype, B.M. Hym.1.773), 7.i.1953 (C. Jacot-Guillarmod).

SOUTHERN RHODESIA, Khami, 2 ♀, 9.xi.1938 (G. Arnold) (B.M.).

SOUTH AFRICA, Cape Province, Aliwal North, 1 ♂, 1 ♀, xii.1922 (R. E. Turner) (B.M.).

The specimens collected by Turner were named and recorded by Forsius (1931) as *A. dissona*.

Athalia glabricollis glabricollis C. G. Thomson

**Athalia glabricollis* C. G. Thomson, 1870, *Opusc. ent.* 2 : 268.

Larva : Lorenz & Kraus, 1957, *Abh. Larvalsyst. Insekt.* 1 : 89-91.

Athalia glabricollis meridiana Benson

**Athalia glabricollis meridiana* Benson, 1954, *Bull. Brit. Mus. (Nat. Hist.) Ent.* 3 (7) : 279.

Athalia turneri Forsius

**Athalia turneri* Forsius, 1931, *Ann. Mag. nat. Hist.* (10) 8 : 21.

Athalia zanzibarica Forsius

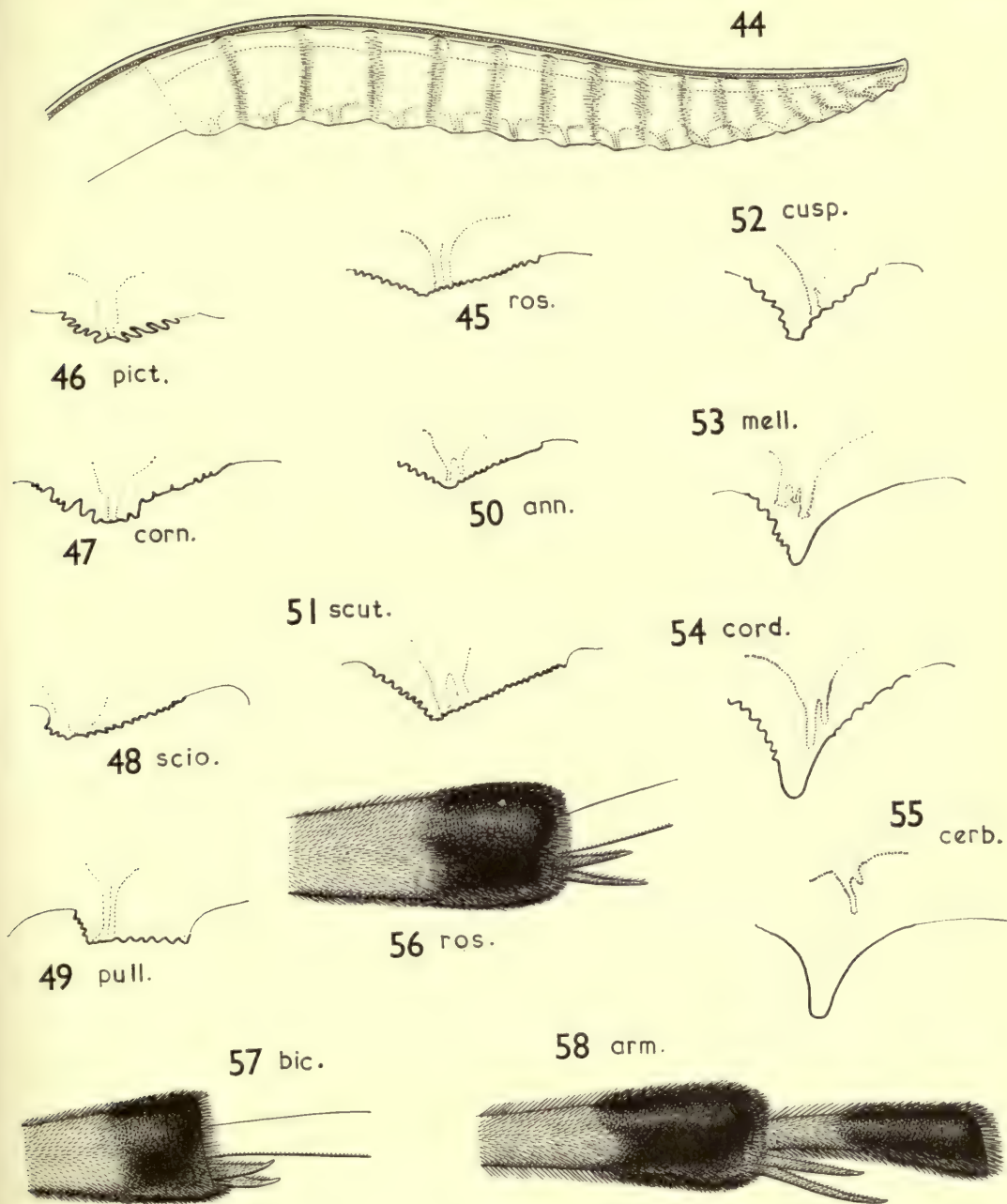
**Athalia zanzibarica* Forsius, 1931, *Ann. Mag. nat. Hist.* (10) 8 : 22.

Athalia ahngeri Kokujev

Athalia ahngeri Kokujev, 1909, *Rev. Ent. U.R.S.S.* 9 : 246.

(iv) Group of *cordata*

Front margin of clypeus each side with an angle that separates off a lateral margin more than half as long as the distance between the antennal sockets (Text-fig. 9). Prelabium shorter than greatest measure of an eye (Text-fig. 21). Antenna only with segments beyond 8th broader than long (Text-fig. 5). Tibial spurs long (inner hind spur about as long as tibial width (Text-fig. 56)). Claws simple. On Compositae, Labiatae, Plantaginaceae and Scrophulariaceae.

FIG. 44. Saw of *Athalia rosae*.

FIGS. 45-54. 10th tooth from apex of saw of: 45, *Athalia rosae*; 46, *A. picta*; 47, *A. cornubiae*; 48, *A. scioensis*; 49, *A. pullicoma*; 50, *Hennedyia annulitarsis*; 51, *Athalia scutellariae*; 52, *A. cuspidata*; 53, *A. mellis*; 54, *A. cordata*; 55, *A. cerberus*.
 FIGS. 56-58. Apex of hind tibia to show spurs in: 56, *Athalia rosae* ♀; 57, *A. bicolor* ♀; 58, *A. armata* ♀.

- 1 Either clypeus dull and pubescent, or underthorax pale and hind tibia is only
ringed with black apically. Saw with shallow blunt teeth 2
- Clypeus shining and only sparsely pubescent. Either underthorax black or hind
tibia mainly infusate. Saw with prominent and sharp teeth (Text-fig. 54) 8
- 2 (1) All lobes of mesonotum black or $\pm$ marked with black 3
- Lateral lobes of mesonotum entirely yellow (E. Asia) 6
- 3 (2) Extreme base of C of fore wing entirely black (Africa) 4
- Extreme base of C of fore wing pale (Eurasia).
[Underthorax normally with a black mesosterno-pleural line and mesepi-
meron: the black may be entirely obsolete or may spread to cover the whole
underthorax. Front tibia scarcely infusate. The form from Manchuria,
Kashmir and no doubt from other parts of East Asia has more infusate wings
(subsp. *melanoptera* Benson). ♀ malar space about two-fifths as long as distance
between antennal sockets. ♀ hypopygium scarcely emarginate behind (Text-
fig. 26); saw as in Text-fig. 45. 4–6 mm. Larva on *Arctium lappa* L., *Glechoma*
hederacea L., *Plantago* sp. and *Veronica*. Europe including Mediterranean,
Asia Minor, Caucasus, Siberia to Japan and mountains of Central Asia from
Kopet Dag to the Pamirs, Altai and Western Himalayas] . . . *circularis* (Klug)
- 4 (3) Front and middle tibiae clearly ringed with black apically. Tegula, pronotum,
and lower mesopleura often yellow 5
- Front and middle tibiae not ringed with black apically. Tegula, pronotum and
mesopleura black.
[Wings bicoloured with apices fuscous and bases hyaline. Natal] ♀ *xantha* sp. n.
- 5 (4) Pronotum and tegula $\pm$ black. Hypopygium in ♀ deeply excised behind each
side of middle. Saw as in Text-fig. 48.
[At high altitudes in Ethiopia, Aberdare Mountains, etc. and in the Congo
smoky-winged forms occur: in the darker forms the pronotum is entirely
black and the upper part of the mesopleura is $\pm$ infusate. Southern Arabia
(Yemen) and Ethiopia and Congo to Natal] ♂♀ *scioensis* Gribodo
- Pronotum and tegula yellow. Hypopygium in ♀ almost entire behind. Saw
(Text-fig. 47).
[Close in structure to *circularis* Klug. but the clypeus is less strongly angled
laterally than in that species, Southern Arabia (Yemen) and Eritrea, Kenya,
Uganda and Congo to the Cape] ♂♀ *concors* Konow
- 6 (2) Antenna with 8th segment onwards broader than long. Front tibia at most
slightly brownish apically 7
- Antenna only from 10th segment broader than long. Front tibia ringed with
black apically.
[Abdomen with 1st tergite black. Saw as in Text-fig. 45. 7 mm. China
(South Kansu)] ♀ *hummeli* Benson
- 7 (6) Abdomen with 1st tergite $\pm$ black. Saw with large denticulations to teeth
(Text-fig. 46).
[China (South Kansu)] ♀ *picta* sp. nov.
- Abdomen entirely pale except for sawsheath. Saw with only fine denticulations
to teeth (c.f. Text-fig. 45).
[India (Chakrata)] ♂♀ *indiana* sp. nov.
- 8 (1) Thorax except for pronotum and tegula mainly black. Wings subhyaline. Tibiae
and tarsi black at apices only; femora entirely yellow. 4–7 mm.
[Larva on *Ajuga*, *Antirrhinum orontium* L. and *Plantago*. Europe including
Mediterranean and Asia Minor to Caucasus] ♂♀ *cordata* Lepeletier
- Thorax except for metanotum almost entirely reddish-yellow. Wings $\pm$ infusate.
Tibiae and tarsi mainly infusate; femora $\pm$ blackened apically. 5–6 mm.
[Larvae on *Veronica*. Japan, China, Kashmir and Assam.]

♂♀ *kashmirensis* Benson

***Athalia circularis* (Klug), comb. nov.**

Tenthredo circularis Klug, 1815, *Mag. Ges. naturf. Fr. Berlin*, 7 : 129.

Athalia lineolata Lepeletier, 1823, *Mon. Tenthred.* : 22, **syn. nov.**

Athalia bolivari* Dusmet, 1896, *An. Soc. esp. Hist. nat.* 25 : 146, **syn. nov.

Athalia cordatoides* Kontuniemi, 1951, *Acta ent. fenn.* 9 : 40, **syn. nov.

Athalia longifoliae* Kontuniemi, 1951, *l.c.* : 42, **syn. nov.

Larva : Lorenz & Kraus, 1957, *Abh. Larvalsyst. Insekt.* 1 : 88-90.

Tenthredo circularis Klug seems by the rules to be the earliest available name for this species. It appeared first as a new name accompanied by a recognizable description but placed in synonymy by the original author.

***Athalia circularis melanoptera* subsp. nov.**

Differs from typical subspecies in that the wings are strongly infusate. MANCHURIA, Harbin, 2 ♂ (including holotype, B.M. Hym. 1.778) 1.viii.1943 (*P. Alin*). KASHMIR, 5-6,000 ft. 1 ♂, v.1901 (*C. G. Nurse*).

***Athalia xantha* sp. nov.**

♀ *Colour*. Head black except for the white labrum, mandible bases and palps, and the piceous clypeus. Thorax black except for the yellowish mesosternum and $\pm$ metanotum. Legs yellow, fore and middle pairs entirely so, hind pair with black ringed apices of tibia and tarsomeres. Abdomen entirely yellow save for sawsheath. Wings sharply bicoloured, apical half infusate, basal half hyaline ; stigma, costa, subcosta and whole of venation in apical half of wings black ; rest of venation in basal half of wings yellow. Length 7.5 mm.

Structure. Antenna 12-segmented with only 8th and following segments broader than long. Malar space about as long as the diameter of a single facet of a compound eye. Inner hind tibial spur almost as long as apical width of tibia (1.0 : 1.2). Hypopygium as in Text-fig. 35. Saw as in Text-fig. 45.

Pubescence. Head and underthorax with normal dense pale pubescence ; mesonotum with brownish pubescence becoming sparse in the middle of each lobe.

NATAL, Weenan, 1 ♀ (Holotype, B.M. Hym. 1.777), ix-x.1925 (*H. P. Thomasset*). (In British Museum.)

***Athalia scioensis* Gribodo**

**Athalia scioensis* Gribodo, 1879, *Ann. Mus. Stor. nat. Genova*, 14 : 347.

A. fumosa* Gribodo, 1879, *l.c.*, **syn. nov.

Specimens of this species in the British Museum examined by Forsius (1931) were labelled and recorded by him as *A. dissona* var. *concors*, *A. ?fumosa*, *A. scioensis* and *A. furvipennis*.

Athalia concors Konow

**Athalia concors* Konow, 1908, *Z. syst. Hym. Dipt.* 8 : 168.

Athalia similis* Mocsáry, 1909, *Ann. hist.-nat. Mus. hung.* 7 : 12, **syn. nov.

Athalia erythraspides* Enslin, 1914, *Rev. Zool. Bot. afr.* 3 : 303, **syn. nov.

Specimens of this species in the British Museum examined by Forsius (1931) were labelled and recorded by him as *A. dissona*, *A. dissona* var. *concors* or *A. dissona* var. *mashonensis*.

Athalia picta sp. nov.

Athalia decorata Konow, Benson, 1932, *Ann. Mag. nat. Hist.* (10) 9 : 528, and figs. 1a, clypeus, 1b, hypopygium, and 1c, saw, *nec* Konow.

♀ *Colour.* Head black except for the white labrum, clypeus and mandible bases and palps ; thorax and abdomen yellow, except for middle of front lobe of mesonotum, post-tergite of scutellum, metanotum, 1st abdominal tergite, and sawsheath as well as apices of hind tibiae and middle and hind tarsal segments. Wings hyaline ; stigma, costa (except basal fifth) and subcosta (except extreme base) and venation black or brown. Length 6-7 mm.

Structure. Antenna 12-segmented with only 10th and 11th broader than long. Malar space one-third as long as distance between antennal sockets. Inner hind tibial spur almost as long as apical width of tibia (1.0 : 1.1). Hypopygium scarcely emarginate each side, saw with shallow teeth and 6-7 large denticulations to each tooth (Text-fig. 46).

Pubescence pale throughout, dense above on head and mesonotum, very sparse on the shining clypeus and sparse on the mesosternum which is glabrous below.

♂ as ♀ except for sexual characters, the pale underside of the antenna and very short malar space.

CHINA, South Kansu, Lu-pa-sze, ♂ and ♀ (Holotype) *in coitu* and 3 ♀ (Stockholm Museum), 2 ♀ (British Museum), 11.vii.1930 (*Dr. Hummel*).

Athalia hummeli Benson

**Athalia hummeli* Benson, 1932, *Ann. Mag. nat. Hist.* (10) 9 : 528-529, figs. 2a, clypeus, 2b, hypopygium.

Athalia indiana sp. nov.

♀ *Colour.* Yellow except for the following which are black : head capsule above clypeus and gena, front lobe of mesonotum apart from margins, apices of middle and hind tibiae and of all tarsal segments and sawsheath. Wings slightly infusate apically and flavescent basally ; stigma, apical two-thirds of costa and of subcosta and rest of venation in apical half of wings brown or black ; basal one-third of costa and of subcosta, and rest of venation in basal half of wings yellowish. Length 7 mm.

Structure. Antenna 12-13-segmented ; 8th and following segments broader than long. Prelabium a little shorter than greatest measure of an eye. Malar space to distance between antennal sockets as 1.0 : 3.8. Inner hind tibial spur about two-

thirds as long as apical width of tibia. Hypopygium emarginate each side of middle. Saw as in Text-fig. 51.

Pubescence. On head and thorax pale, becoming sparse on temples behind, and middle of mesonotal and scutellar lobes; on the underthorax is a glabrous area covering the meso-pleurosternal line.

♂ as ♀ apart from sexual characters and that the antenna is pale beneath, the front tarsal segments are scarcely darkened apically and the middle legs only obscurely marked with dark colour. The malar space is barely as long as the diameter of a single compound eye facet. Length 6 mm.

INDIA, Chakrata: Bodyar 8,000 ft., 1 ♀ (Holotype, B.M. Hym. 772), 21.vi.1923 (C. F. E. Beeson); Lambatach, 7,600 ft., 1 ♂, 9.vi.1924 (B. M. Bhatia) (B.M.).

Athalia cordata Lepeletier

Athalia cordata Lepeletier, 1823, *Mon. Tenth.*: 22.

Athalia blanchardi Brullé in Lepeletier, 1846, *Hist. nat. Ins. Hym.* 4: 663.

Larva: Konow, 1901, *Z. syst. Hym. Dipt.* 1: 59.

Larva: Rungs, 1949, *Rev. Path. vég.* 28 (3): 170-172.

Athalia kashmirensis Benson, stat. nov.

**Athalia cordata kashmirensis* Benson, 1932, *Ann. Mag. nat. Hist.* (10) 9: 187.

Athalia veronicae Takeuchi, 1949, *Trans. Kansai. ent. Soc.* 14 (2): 49, nom. nud.

Athalia veronicae Takeuchi, 1952. A generic classification of the Japanese Tenthredinidae (Hymenoptera: Symphyta) Kyoto: 29.

(v) Group of *rosae*

Clypeus symmetrically rounded in front and not angled laterally (Text-figs. 13 and 14) or angle is so close to the edge that the lateral portion of the clypeal front margin is shorter than half the distance between the antennal sockets. Prelabium shorter than greatest measure of eye (Text-fig. 21). Tibial spurs long (Text-fig. 56). (Inner hind spur at least as long as apical width of tibia.) Claws simple. Pronotum usually pale. Saw as in Text-figs. 44-45 except in *cornubiae* (Text-fig. 47). On Cruciferae and Crassulaceae.

KEY TO SPECIES SECTIONS

- | | | |
|---|---|--|
| A | All tibiae at most only ringed apically with black and femora all yellow | (a) <i>rosae</i> and <i>liberta</i> complexes |
| B | Hind tibiae (at least over apical two-fifths above) or middle femur mainly infusate | (b) <i>lugens</i> and <i>nigromaculata</i> complexes |
| (a) <i>rosae</i> and <i>liberta</i> complexes | | |
| 1 | Middle lobe of mesonotum entirely yellow | 2 |
| — | Middle lobe of mesonotum black or at least partly black | 4 |
| 2 (1) | Lateral lobe of mesonotum ± marked with black. Malar space of ♀ (Text-fig. 13) about half distance between antennal sockets and in ♂ (Text-fig. 14) about one-quarter. Thorax densely pubescent all over. Hind tibia with less than apical quarter infusate 6-8 mm. ♂♀ (forms of <i>rosae</i>) | 3 |
| — | Lateral lobes of mesonotum entirely yellow. Malar space of ♀ only about one-fifth distance between antennal sockets. Thorax shining and sparsely pubescent, | |

subglabrous on mesonotum behind and on mesosternum. Hind tibia with apical third infusate. Saw not seen. 8 mm.

- [Punjab] ♀ **antennata** Cameron
- 3 (2) Black fleck on lateral lobe of mesonotum does not extend forwards beyond hind margin of tegula. Wings subhyaline in the north of its range, becoming more and more infusate towards the south and in Japan.
[Larvae on Cruciferae : *Brassica rapa* L., *Raphanus raphanistrum* L., etc. E. Asia, E. Siberia, Manchuria to Himalayas and Japan] **rosae ruficornis** Jakovlev
- Black fleck on lateral lobe of mesonotum extends forwards at least beyond the level of the hind margin of the tegula. Wings subhyaline in north of range, becoming more and more infusate towards the south.
[Larvae on Cruciferae : *Armoracia rusticana* Gaertn., Mey. & Scherb., *Barbarea* sp., *Brassica rapa* L., and *napus* L., *Raphanus raphanistrum* L., *Rorippa amphibia* (L.) Besser, *Sinapis alba* L., and *arvensis* L., and *Sisymbrium* spp. Temperate Europe to South West Siberia, Mediterranean region including North Africa, Palestine and Asia Minor to Caucasus and Iran.] **rosae rosae** (L.)
- 4 (1) Mesonotum mainly black in both sexes, the lateral lobes at most with their outer edges yellow; ♂ with at least scutellum partly black. Malar space (♀) one-third to one-quarter as long as distance between antennal sockets 5
- Mesonotum in ♀ yellow with a black fleck on the middle and on each of the lateral lobes; in the ♂ the black flecks may spread to cover all of these lobes but at least the scutellum is entirely yellow. Malar space (♀) about one-fifth as long as distance between antennal sockets.
4-6 mm. Larvae on Cruciferae : *Brassica rapa* L., and *Raphanus raphanistrum* L. Madagascar] ♂♀ **malagassa** Saussure
- 5 (4) Antenna with at most 9th segment onwards broader than long. Hypopygium in ♀ less emarginate (Text-figs. 34 and 39) 6
- Antenna with 7th or 8th segments onwards broader than long. Hypopygium of ♀ deeply excised (Text-fig. 43) on hind margin.
[6-7 mm. Alps of France, Switzerland and Austria, and Macedonia] ♂♀ **paradoxa** Konow
- 6 (5) Hypopygium of ♀ strongly emarginate each side of middle (Text-fig. 39). Saw as in Text-fig. 47. Parthenogenetic species with ♂ unknown. 5-7 mm.
[Larva on *Sedum album* L. Central and South Europe, Asia Minor, Transcausia and South West Iran] ♀ **cornubiae** Benson
- Hypopygium of ♀ with hind margin almost entire (Text-fig. 34). Saw as in Text-fig. 45 or ♂. 5-7 mm.
[Subspecies *liberta* Kl. from all Europe and Mediterranean to Caucasus, South West Iran and mountains of Central Asia to Uzbek and Kirghiz and eastwards to the Amur region in East Siberia has subhyaline wings.
Subspecies *yanoi* Takeuchi, from Seghalien and Japan, has infusate wings.
Larva on Cruciferae : *Alliaria petiolata* (Bieb.) Cavara and Grande, *Arabis thaliana* (L.) Heynh., *Cardamine hirsuta* L., and *Sisymbrium officinale* (L.) Scop.] ♂♀ **liberta** Klug

(b) **lugens** and **nigromaculata** complexes

- 1 Abdomen with 6 or more tergites beyond the 1st with a black fleck each side 2
- Abdomen without black flecks on tergites beyond 1st 3
- 2 (1) All tibiae, front and middle femora and apex of hind femur mainly black. Hind basitarsus longer than two following segments. ♀ Hypopygium scarcely emarginate (cf. Text-fig. 27). 4.5-6.5 mm.
[Central Asia : Himalayas, (Sikkim, 7,000 ft.) and North East Burma (Kimbaita, 7,000 ft.)] ♂♀ **sikkimensis** Benson

- Tibiae as well as middle and hind femora only marked with black apically ; front femur entirely yellow. Hind basitarsus only as long as two following segments. ♀ Hypopygium excised each side of middle on hind margin (cf. Text-fig. 39). 6-8.5 mm.
[Central Asia : Himalayas (Tibet, Kashmir, India 9,000-12,000 ft.)]
♂♀ **nigromaculata** Cameron
- 3 (1) All femora pale, at most tipped with black apically. Pronotum mainly yellow.
[Malar space (♀) about three-sevenths distance between antennal sockets] 4
- Front and middle femora mainly and hind femur at least apically black. Pronotum often mainly infuscate.
[All tibiae and tarsi mainly black. ♀ Hypopygium as in *lugens* (Text-fig. 17)] 7
- 4 (3) Femora all yellow. All tibiae and tarsi mainly black above. Hypopygium of ♀ only slightly emarginate behind (forms of *lugens* Kl.) 5
- Hind and middle femora tipped with black apically. Front tibiae and all tarsal segments black only apically ; middle and hind tibiae also black basally. Hypopygium of ♀ excised on hind margin each side of middle (Text-fig. 41). 5-8 mm.
[Mesothorax entirely reddish-yellow. Larvae on Cruciferae : *Brassica rapa* L., *Raphanus raphanistrum* L. East Asia : East Siberia and Japan.]
♂♀ **japonica** Klug
- 5 (4) Wings strongly infusate especially basally. Mesonotum variable in colour, usually with at least the lateral margins of the front lobes yellow, and often extensively or mainly yellow. 5-7.5 mm.
[East Asia] 6
- Wings subhyaline or slightly infuscate. Mesonotum usually entirely black. 4-6 mm.
[Europe] ♂♀ **lugens lugens** Klug
- 6 (5) Mesonotum mainly black ; usually with only the margins of the front and middle lobes yellow, though occasionally in females yellow covers all the parts in front of the tegulae. 5-7 mm.
Larvae on Cruciferae : *Brassica rapa* L. and *nigra* (L.) Koch and also *Raphanus raphanistrum* L. Japan] ♂♀ **lugens infumata** (Marlatt)
- Mesonotum mainly yellow ; in East Siberia the black may extend as far forward as the tegulae in some males but in India and South China to Java the mesonotal lobes including the scutellum are usually entirely yellow. 5-7.5 mm.
[Larvae on Cruciferae : *Brassica nigra* (L.) Koch, *napus* L., and *rapa* L. *Raphanus raphanistrum* L. and *Lepidium sativum* L.
Mainland from Kamtchatka to South India and Malaya as well as Formosa, Borneo, Java etc., in North East Burma (Kimbaiti) at 7,000 ft.]
♂♀ **lugens proxima** (Klug)
- 7 (3) Mesonotum and mesopleura mainly red 8
- Thorax entirely black. 6 mm.
[Malar space of ♀ almost two-fifths distance between antennal sockets. North East Burma (Kimbaiti, 7,000 ft.)] ♂♀ **birmanica** sp. nov.
- 8 (7) Malar space in ♀ about half as long as distance between antennal sockets. Frontal area with only a slight medial depression. 5-6 mm.
[Central Asia : China (Kan-Su)] ♀ **kansuensis** Benson
- Malar space in ♀ less than one-third distance between antennal sockets. Frontal area with a deep round medial puncture. 5-6 mm.
[Central Asia : China (Szechwan) and North East Burma (Kambaiti, 7,000 ft.)] ♀ **scapulata** Konow

***Athalia antennata* Cameron**

Athalia antennata* Cameron, 1902, *J. Bombay nat. Hist. Soc.* **14 : 447.

***Athalia rosae ruficornis* (Jakovlev) comb. nov.**

Athalia spinarum var. *ruficornis* Jakovlev, 1888, *Horae. Soc. ent. ross.* **22** : 373.

Athalia leucostoma* Cameron, 1904, *Z. syst. Hym. Dipt.* **4 : 108.

Athalia spinarum japonensis* Rohwer, 1910, *Proc. U.S. nat. Mus.* **39 : 109.

Larva : Takizawa, M. and Akiyama, T., 1935, *Kontyû*, **9** : 207-220, 1 pl.

***Athalia rosae rosae* (L.)**

**Tenthredo rosae* L., 1758, *Syst. Nat.* p. 557 *nec auctt.*

Tenthredo colibri Christ, 1791, *Nat. Ins.* p. 434.

Tenthredo spinarum Fabricius, 1793, *Ent. syst.* **2** : 110.

Tenthredo centifoliae Panzer, 1798, *Faun. Ins. Germ.* Heft **49**, tab. 18.

Athalia spinarum (Fabricius) Leach 1817 *Zool. Miscell.* **3** : 126.

Larva : Lorenz & Kraus, 1957, *Abh. Larvalsyst. Insekt.* **1** : 90.

***Athalia malagassa* Saussure**

Athalia malagassa Saussure, 1890, in Grandidier : *Hist. Madagascar*, pl. 27, fig. 15a and b.

Athalia malagassa Saussure, Konow, 1908, *Z. syst. Hym. Dipt.* **8** : 166.

Larva : Paulian, 1949, *Mém. Inst. sci. Madagascar*, **3** : 375-382.

***Athalia paradoxa* Konow**

Athalia paradoxa* Konow, 1886, *Dtsch. ent. Z.* **30 : 78.

***Athalia cornubiae* Benson**

Athalia cornubiae* Benson, 1931, *Ent. mon. Mag.* **67 : 110.

Larva : Gradwell, 1957, *Ent. mon. Mag.* **93** : 12.

***Athalia liberta liberta* (Klug)**

Tenthredo rosae var. *liberta* Klug, 1815, *Mag. Ges. naturf. Fr. Berlin*, **7** : 129.

Tenthredo liberta (Klug), Klug, 1817 in Germar : *Reise n. Dalmat.* **2** : 257.

Athalia ancilla Lepeletier, 1823, *Mon. Tenth.* : 22.

Athalia liberta (Klug) Priesner, 1928, *Ent. Mitt.* **27** : 282.

Larva : Lorenz & Kraus, 1957, *Abh. Larvalsyst. Insekt.* **1** : 89-91.

***Athalia liberta yanoi* Takeuchi**

Athalia liberta yanoi Takeuchi, 1952, *Gen. Class. Jap. Tenthredinidae*, pp. 29-30.

***Athalia sikkimensis* (Benson) stat. nov.**

Athalia nigromaculata sikkimensis* Benson, 1932, *Ann. Mag. nat. Hist.* (10) **9 : 530-531.

***Athalia nigromaculata* Cameron**

Athalia nigromaculata* Cameron, 1902, *J. Bombay nat. Hist. Soc.* **14 : 446.

Athalia japonica (Klug)

Tenthredo japonica Klug, 1815, *Mag. Ges. naturf. Fr. Berlin*, 7 : 131.

Athalia japonica (Klug) Klug, 1834, *Jahrb. d. Insectenk.* 1 : 253.

Athalia nigronotum Matsumura, 1918, *Thous. Ins. Japan*, Suppl. 4 : 68.

?*Athalia novittata* Kokujev, 1927, *Trav. Comm. Lac Bajkal*, 2 : 64.

Larva : Narutomi, 1931, *Jap. J. appl. Zool.* 3 : 150-152. [In Japanese.]

Athalia lugens lugens (Klug)

Tenthredo lugens Klug, 1815, *Mag. Ges. naturf. Fr. Berlin*, 7 : 129.

Athalia lugens (Klug) Klug, 1834, *Jahrb. d. Insectenk.* 1 : 253.

Athalia lugens infumata (Marlatt)

**Phyllotoma infumata* Marlatt, 1898, *Proc. U.S. nat. Mus.* 21 : 494.

Athalia lugens infumata Marlatt, Rohwer, 1910, *Proc. U.S. nat. Mus.* 39 : 110.

Larva : Narutomi, 1931, *Jap. J. appl. Zool.* 3 : 190-192.

Athalia lugens proxima (Klug)

Tenthredo proxima Klug, 1815, *Mag. Ges. naturf. Fr. Berlin*, 7 : 130.

Athalia proxima (Klug) Klug, 1834, *Jahrb. d. Insectenk.* 1 : 253.

Athalia tibialis* Cameron, 1876, *Trans. ent. Soc. Lond.* 1876 : 460. **Syn. nov.

Athalia spinarum* var. *orientalis* Cameron, 1877, *Trans. ent. Soc. Lond.* 1877 : 90. **Syn. nov.

**Athalia proxima* var. *funebis* Forsius, 1925, *Notul. ent. Helsingf.* 5 : 91.

Athalia colibri var. *kuroiwae*, Matsumura & Uchida, 1926, *Ins. Mats.* 1 : 70. **Syn. nov.**

Athalia lugens* var. *camtschatica* Forsius, 1928, *Notul. ent. Helsingf.* 8 : 46. **Syn. nov.

Athalia lugens proxima (Klug) Benson 1932, *Ann. Mag. nat. Hist.* (10) 9 : 183.

Athalia lugens* var. *tristis* Forsius, 1934, *Rev. suisse Zool.* 41 : 106. **Syn. nov.

Larva : Maxwell-Lefroy, H. & Ghosh, C. C., 1908, *Mem. Dep. Agric. India, Ent.* 1 : 6.

Sonan & Shibath, 1928, *Trans. nat. Hist. Soc. Formosa*, 18 : 44-64.

Athalia kansuensis (Benson) stat. nov.

**Athalia lugens kansuensis* Benson, 1932, *Ann. Mag. nat. Hist.* (10) 9 : 186.

Athalia scapulata Konow

**Athalia scapulata* Konow, 1903, *Annu. Mus. zool. Acad., St. Pétersb.* 8 : 117.

Athalia birmanica sp. nov.

♀ *Colour*. Head and thorax entirely black, legs black except for hind coxa, trochanters and femur (apart from extreme apex) ; abdomen yellow except for the black 1st tergite and sawsheath. Wings densely infuscate ; stigma and venation black. Length 6 mm.

Structure. Antenna 11-12 segmented (the two apical segments $\pm$ fused), with no flagellar segment broader than long. Malar space about two-fifths as long as distance between antennal sockets (1.0 : 2.4). Legs with inner hind tibial spur about as long as apical width of tibia. Hypopygium slightly emarginate each side of middle as in *lugens* (Text-fig. 27). Saw with very shallow teeth as in *rosae* (Text-fig. 45).

Pubescence infusate above on head, on mesonotum and mesopleura, pale below; mesosternum with a large glabrous patch each side.

♂ as ♀ apart from sexual characters and that the clypeus is $\pm$ pale, the antennae may have 2-3 apical segments fused, the malar space is less than the diameter of a single facet of a compound eye, the mesothorax below is unevenly pubescent without glabrous patches and that the size is smaller (5-5.5 mm.).

N.E. BURMA, Kambaiti, 7,000 ft. 1 ♀ (Holotype), 15 ♂, 1.iv to 9.vi.1934 (*R. Malaise*). (Holotype and 9 ♂ paratypes in Stockholm Museum, 6 ♂ paratypes in British Museum.)

(vi) Group of *furvipennis*

Clypeus asymmetrical (Text-fig. 17) or $\pm$ angularly produced medially in front (Text-figs. 15-16). Prelabium often as long as or longer than greatest measure of eye (Text-fig. 22). Tibial spurs long (inner hind spur at least as long as apical width of tibia (Text-figs. 56 and 58). Claws simple. Pronotum often black. On Cruciferae (*Brassica* etc.).

KEY TO SPECIES COMPLEXES

- | | | |
|-------|--|--------------------------------|
| 1 | Legs mainly yellow with tibiae and tarsomeres ringed only apically with black.
Hind inner tibial spur about as long as apex of tibia. Pronotum yellow or black | 2 |
| - | Legs very variable in colour but $\pm$ infusate and at least with middle femur mainly suffused. Tibial spurs long: hind inner spur longer than apex of tibia.
Pronotum black. [♀ hypopygium scarcely emarginate behind] | (c) <i>nigripes</i> complex |
| 2 (1) | Pronotum mainly yellow | (a) <i>dissona</i> complex |
| - | Pronotum mainly black | (b) <i>furvipennis</i> complex |

(a) *dissona* complex

- | | | |
|-------|--|-------------------------------|
| 1 | Prelabium as long as or longer than greatest measure of eye (Text-fig. 22) and/or fore tibia entirely yellow | 2 |
| - | Prelabium shorter than greatest measure of eye (Text-fig. 21) and front tibia black-tipped apically.
[Underthorax and often scutellum $\pm$ yellow. Malar space in ♀ about one-third distance between antennal sockets. ♀ hypopygium slightly emarginate each side behind, cf. Text-fig. 29. Saw as in Text-fig. 45. 5-7 mm. Ethiopia, Nigeria and Congo] | ♂♀ <i>schoutedeni</i> Forsius |
| 2 (1) | Front tibia and underthorax entirely yellow. Prelabium about as long as greatest measure of eye | 3 |
| - | Front tibia ringed apically with black. Underthorax with black band over the meso-sternopleural line. Prelabium longer than greatest measure of eye.
[♀ hypopygium as in Text-fig. 29. Saw with sharp prominent teeth (cf. Text-fig. 53). 6-7 mm. Congo] | ♂♀ <i>dulcis</i> Benson |
| 3 (2) | Middle legs with apices of tibiae and tarsal segments marked with black. Malar space in ♀ about one-third distance between antennal sockets and about the length of three compound eye facets. Antenna with 8th segment onwards broader than long. Fore wings with apices subinfusate. Underthorax yellow. ♀ hypopygium scarcely emarginate (cf. Text-fig. 29). Saw as in Text-fig. 53. 5-7 mm.
[Sierra Leone, Congo, Nyasaland and Southern Rhodesia]. | ♂♀ <i>dissona</i> Konow |

Front and middle legs entirely yellow. Malar space in ♀ very short, only about as long as a single compound eye facet. (Antenna in unique type missing.) Wings uniformly subhyaline. Underthorax yellow. ♀ hypopygium excised each side of middle (cf. Text-fig. 38). Saw as in Text-fig. 45. 6-7 mm.
[South-east Africa : Mozambique] . . . ♀ *limpopo* sp. nov.

(b) *furvipennis* complex

- 1 Prelabium longer than greatest measure of eye (Text-fig. 22). ♀ hypopygium scarcely emarginate behind . . . 2
- Prelabium shorter or only as long as greatest measure of eye (Text-fig. 21) . . . 5
- 2 (1) Clypeus not more than one and a half times as long medially as distance between antennal sockets. Front tibia often black-ringed apically. Mesosternum often entirely black. Saw often with sharp prominent teeth (cf. Text-fig. 53) . . . 3
- Clypeus at least about two times as long medially as distance between antennal sockets. Front tibia at most brownish at apex behind. Mesosternum ± yellow. Saw as in Text-fig. 49. 6-7 mm.
[Malar space of ♀ less than half distance between antennal sockets. Kenya and Uganda] . . . ♂♀ *pullicoma* Konow
- 3 (2) Malar space in ♀ at least about two-thirds distance between antennal sockets (Text-figs. 15 and 16). Saw with prominent sharp teeth (Text-fig. 53). Underthorax ± pale below except sometimes in Congo basin . . . 4
- Malar space in ♀ about half distance between antennal sockets. Saw with blunt shallow teeth (cf. Text-fig. 45). ♀ hypopygium scarcely emarginate (cf. Text-fig. 35). Underthorax entirely black. 5-7 mm.
[Wings subhyaline or (in the mountains of Abyssinia, East Africa and the Cape region) ± infusate. 1st abdominal tergite often ± infusate. ♀ hypopygium (cf. Text-fig. 35). Ethiopia to the Cape] . . . ♂♀ *clavata* Konow
- 4 (3) Wings subhyaline. Face with labrum, clypeus and cheeks yellow. Underthorax with mesosternum and mesopleura below ± yellow. Mesonotum with glabrous area on the middle of each lateral lobe. 5.5-7 mm.
[? Larvae on *Salvia* and *Coleus barbutus* Benthams (Labiatae). Natal, Zululand, Transvaal and Cape Colony] . . . ♂♀ *mellis* sp. nov.
- Wings strongly infusate. Face and underthorax entirely black. Mesonotum pubescent all over. 6-8 mm.
[Congo, Uganda and Kenya] . . . ♀ *pluto* Benson
- 5 (1) Malar space in ♀ at least one-third distance between antennal sockets; and in ♂ often longer than one compound eye facet. (Unfortunately ♂♂ have not yet been associated with the ♀♀ of *cerberus*, *furvipennis* and *umbrosa* severally.) Mesosternum often entirely black. Wings ± subhyaline or infusate, but base and apex not strongly contrasted . . . 6
- Malar space in ♀ only about one-quarter distance between antennal sockets; and in ♂ scarcely as long as a single compound eye facet. Mesosternum and ± mesopleura yellow. Wings subhyaline at base but strongly infusate at apex. 5-8 mm.
[Saw as in Text-fig. 45. ♀ hypopygium slightly emarginate each side behind (cf. Text-fig. 35). Congo, Uganda, Kenya, Tanganyika, Nyasaland, Southern Rhodesia and Zululand] . . . ♂♀ *ustipennis* Mocsáry
- 6 (5) Malar space in ♀ more than half distance between antennal sockets. Saw with shallow blunt teeth (cf. Text-fig. 45) . . . 7
- Malar space in ♀ less than half distance between antennal sockets. Saw with prominent sharp teeth (Text-fig. 55).
[Wings strongly infusate. ♀ hypopygium slightly emarginate each side behind (cf. Text-fig. 35). 7 mm. Ethiopia and Congo] . . . ♀ *cerberus* Benson

- 7 (6) Malar space in ♀ little more than half distance between antennal sockets (1.0 : 1.7). Wings infusate or subhyaline. ♀ hypopygium emarginate behind as in Text-fig. 29. 5-7 mm.

[Larvae on various Cruciferae : pest on *Brassica rapa* L. (= *campestris* L.). Ethiopia, Kenya, Uganda, Congo, Nyasaland, Zululand, Natal, Basutoland and Cape Province.] ♀ *furvipennis* Konow

- Malar space of more than two-thirds distance between antennal sockets (1.0 : 1.2-1.3). Wings heavily infusate. ♀ hypopygium scarcely emarginate behind (cf. Text-fig. 35). 6 mm.

[Uganda and Congo (Mt. Ruwenzori)] ♀ *umbrosa* sp. nov.

(c) *nigripes* complex

- 1 Inner hind tibial spur less than half as long as metatarsus (Text-fig. 56) 2

- Inner hind tibial spur more than half as long as metatarsus (Text-fig. 58).

[Prelabium about as long as greatest measure of eye. Malar space in ♀ about four-fifths as long as distance between antennal sockets. ♀ hypopygium as in Text-fig. 24. Saw as in Text-fig. 51. 6-7 mm. Uganda and Congo]

♂♀ *armata* Benson

- 2 (1) Prelabium longer than greatest measure of eye (Text-fig. 22). 1st tergite mainly black 3

- Prelabium shorter than greatest measure of eye (Text-fig. 21). 1st tergite often mainly pale but ± suffused medially to mainly black.

[Saw as in Text-fig. 51. 5-7 mm. Uganda and Congo (Mt. Ruwenzori)]

♂♀ *nigripes* Enslin

- 3 (2) Malar space in ♀ about two-thirds distance between antennal sockets. Saw with prominent and sharp teeth (cf. Text-fig. 53). 5-6 mm.

[Congo] ♀ *asbolos* Benson

- Malar space in ♀ less than half distance between antennal sockets. Saw as in Text-fig. 45. 6-7 mm.

[Congo] ♀ *pulla* Benson

Athalia schoutedeni Forsius

Athalia schoutedeni* Forsius, 1928, *Rev. Zool. Bot. afr.* **16 : 240.

Athalia dulcis Benson

Athalia dulcis* Benson, 1961, *Expl. Parc national de l'Upemba, Mission G. F. de Witte*, **60 (2) : 8.

Athalia dissona Konow

Athalia dissona* Konow, 1908, *Z. syst. Hym. Dipt.* **8 : 167.

Athalia limpopo sp. nov.

♀ *Colour*. Head black except for face below antennae, mouthparts and undersides of antennae which are yellowish white. Mesonotum black except for posterior half of scutellum and postscutellum ; pronotum, tegula, metanotum, underthorax and abdomen (except sawsheath) yellow. Legs yellow except for apex of hind tibia (and ? apices of hind tarsal segments which are missing in the unique type). Wings

hyaline; stigma, apical three-quarters of costa and subcosta (except extreme base) black; rest of venation yellow. Length 6.5 mm.

Structure. Antenna (both flagella missing from type). Prelabium longer than greatest length of eye as 1.1 : 1.0. Clypeus slightly angled in front and produced forward more on right than left side. Malar space about as long as diameter of single compound-eye facet or about one-sixth of distance between antennal sockets (0.17 : 1.0). Inner hind tibial spur about as long as apical width of tibia. Hypopygium with hind margin tridentate (cf. Text-fig. 38). Saw with very shallow teeth as in *A. rosae* (Text-fig. 45).

Pubescence pale, short and evenly distributed over head and thorax.

S.E. AFRICA : MOZAMBIQUE, Delagoa Bay, 1 ♀ (Holotype, B.M., Hym. 1.774) (purchased from Mr. Janson, B.M. 1883-29).

Athalia pullicoma Konow

**Athalia pullicoma* Konow, 1908, *Z. syst. Hym. Dipt.* 8 : 166.

Athalia clavata Konow

**Athalia clavata* Konow, 1907, *Schwed. Zool. Exp. Kilimandj.* 8 : 5.

Athalia mellis sp. nov.

♀ *Colour.* Head black except for face below antennae, mouthparts and $\pm$ the undersides of the antennae which are yellow. Thorax black except for the tegula, $\pm$ hind margins of the pronotum and $\pm$ the mesosternum and lower part of mesopleuron. Legs yellow with apices of all tibiae and tarsal segments black. Abdomen yellow except $\pm$ middle of 1st tergite and sawsheath which are black. Wings subhyaline, slightly infusate apically and flavescent basally; stigma and (except at their extreme bases) costa and subcosta black; rest of venation yellow, becoming piceous in apical halves of wings. Length 5.5-7 mm.

Structure. Antenna 10-segmented, only 8th and 9th broader than long (10th consists of 2 $\pm$ fused segments). Prelabium longer than eye (as 1.2 : 1.0). Clypeus rounded in front (Text-fig. 15). Malar space about two-thirds as long as distance between antennal sockets (0.7 : 1.0). Hind inner tibial spur about as long as apical width of tibia. Hypopygium slightly emarginate each side of middle (cf. Text-fig. 35). Saw with very sharp prominent teeth (Text-fig. 53).

Pubescence. Pale and evenly distributed on head and underthorax but sparse in the middle of each lateral mesonotal lobe and on the scutellum.

♂ as ♀ except for sexual characters and that the 1st antennal segment and face are yellowish-white, the 8th antennal segment is $\pm$ as long as broad, the malar space (Text-fig. 16) is only about as long as two and a half times diameter of a compound-eye facet, or less than a third distance between the antennal sockets (0.3 : 1.0).

SOUTH AFRICA : TRANSVAAL : Sabie. 1 ♂, i. 1952 (leg. *Inmiph*) (München Mus.).

ZULULAND: Eshowe, 2 ♂, 23-30.iv.1926 (*R. E. Turner*) (B.M.); Mtunzini, 1 ♂, 2 ♀, 15.ix.1949 (*A. L. Capener*) (B.M.); Nqutu, 1 ♀, 19.v.1955 (*A. H. Newton*) (B.M.).

NATAL: Biggarsberg, 11 ♂, 1 ♂ and 1 ♀ *in copula*, and 10 ♀ (including Holotype B.M. Hym. 1.775); Van Reenen, Drakensberg, 1 ♂, 1 ♀, 6,500-7,500 ft., x.1926, 1 ♂, xi.1926, 1 ♂, xii.1926 (*R. E. Turner*) (B.M.); Pietermaritzburg, 1 ♂, 27.iii.1955 (B.M.); 1 ♀, ix.1959 (Natal Mus.) (*B. Stuckenburg*); near Kraskop, indigenous forest, 1 ♂, 11.ix.1954 (*B. Stuckenburg*) (Natal Mus.); Edensdale, 2 ♂, 1-i-1953 (*E. McC. Callan*) (1 ♂, B.M.; 1 ♂ in Grahamstown Mus.); Kloof, 1,500 ft., 1 ♀, ix.1926 (*R. E. Turner*) (B.M.).

BASUTOLAND, Hensley's Dam, Leribe, 1 ♀, 19.ii.1948 (*C. Jacot-Guillarmod*) (B.M.).

ORANGE FREE STATE, Harrismith, 1 ♂, ii.1927 (*R. E. Turner*) (B.M.); Witzieshoek, 6,100 ft., 1 ♀, 23.ii.1929 (*Hugh Scott*) (B.M.).

CAPE PROVINCE, Umtata, Transkei, 1 ♂, 2 ♀, 18.ii-18.iii.1923 (*R. E. Turner*) (B.M.); Grahamstown, 1 ♂, i.1954 (*F. Zumpf*) (München Mus.), 1 ♂, 6.ii.1952, 1 ♂, ix.1954 (*E. McC. Callan*) (Grahamstown Mus.); Katburg, 4,000 ft., 1 ♀, x.1932 (*R. E. Turner*) (B.M.); Pondoland, Port St. John, 1 ♀, 10-31.vii.1923 (*R. E. Turner*) (B.M.); Durban, 1 ♀, 1902 (*F. Muir*) (B.M.); Port Elizabeth, Lovemore Park, on *Coleus barbutus* Benthams, 3 ♂, viii.1955 (*J. S. Taylor*) (B.M.); Port Elizabeth on *Salvia*, 1 ♂, 9.viii.1956 (*J. S. Taylor*) (Grahamstown Mus.).

The specimens in the British Museum collected by F. Muir and R. E. Turner and examined by Forsius (1931) were labelled and recorded by him as *Athalia incomta* Konow.

Athalia cerberus Benson

**Athalia cerberus* Benson, 1961, *Expl. Parc national Albert—Mission G. F. de Witte* (1933-35), 97: 16.

Athalia pluto Benson

**Athalia pluto* Benson, 1961, *Expl. Parc national Albert—Mission G. F. de Witte* (1933-35), 97: 10-11.

Athalia ustipennis Mocsáry

**Athalia ustipennis* Mocsáry, 1909, *Ann. hist.-nat. Mus. hung.* 7: 12.

Athalia mashonensis* Enslin, 1911, *Dtsch. ent. Z.* 1911: 668. **Syn. nov.

Athalia furvipennis Konow

**Athalia furvipennis* Konow, 1907, *Schwed. zool. Exp. Kilimandjaro*, 8: 5.

Athalia flacca* Konow, 1907, *l.c.* **Syn. nov.

Athalia umbrosa sp. nov.

♂ *Colour*. Head and thorax black, obscurely brownish on face below antennae and on underside of antenna. Legs yellow with coxae $\pm$ obscurely and apices of

tibiae and tarsal segments of all legs broadly ringed with black. Abdomen yellow except $\pm$ for middle of 1st tergite and sawsheath which are black. Wings strongly infusate; stigma and venation black. Length: 6 mm.

Structure. Antenna 11-segmented; only 10th broader than long. Prelabium longer than eye (1.1:1.0). Malar space four-fifths as long as distance between antennal sockets (0.8:1.0). Clypeus angularly produced in front slightly left of the middle. Inner hind tibial spur about as long as apical width of tibia. Hypopygium scarcely emarginate each side of middle as in *A. abyssinica* (Text-fig. 24). Saw with shallow blunt teeth as in *A. rosae* (Text-fig. 45).

Pubescence brown above, pale below, densely and evenly covering head capsule and thorax.

AFRICA, UGANDA: Ruwenzori Range, 1 ♀, (Holotype Brit. Mus., Hym. 1.776) xii.1934-1.1935 (*F. W. Edwards*) (Brit. Mus. E. African Expedition); Mt. Elgon, Butandiga, 7,000 ft., 1♀, 1935 (*J. Ford*) (B.M.).

CONGO: Ruanda, Blumba, 2,300 m., 1 ♀, 6.xi.1953 (*P. Basilewsky*) (Tervuren Mus.); Kivu, Burunga, 1 ♀, 5.xii.1925 (*H. Schouteden*) (Tervuren Mus.).

Athalia nigripes Enslin

**Athalia nigripes* Enslin, 1912, *Ergebn. Zentr. Afrik. Exp.* 5: 51.

Athalia asbolos Benson

**Athalia asbolos* Benson, 1961, *Expl. Parc national Albert—Mission G. F. de Witte* (1933-35), 97: 18.

Athalia pulla Benson

**Athalia pulla* Benson, 1961, *Expl. Parc national Albert—Mission G. F. de Witte* (1933-35), 97: 19.

Athalia armata Benson

**Athalia armata* Benson, 1961, *Expl. Parc national Albert—Mission G. F. de Witte* (1933-35), 97: 19-20.

(vii) Group of *himantopus*

Clypeus subtruncate in front and medially shorter than distance between antennal sockets (Text-fig. 18). Prelabium shorter than greatest measure of eye (Text-fig. 21). Tibial spurs long (inner hind spur at least as long as apical width of tibia). Claws simple. ♀ hypopygium scarcely emarginate (cf. Text-fig. 25). Saw as in Text-fig. 45. 6.5-8.5 mm. One species: *A. himantopus* Klug, in 3 geographical races with very few intermediates.

- | | | |
|---|--|---|
| 1 | Wings uniformly $\pm$ flavescent-hyaline | 2 |
| - | Wings with the apical halves $\pm$ infusate and the basal $\pm$ flavescent-hyaline.
[♀ with conspicuous glabrous patch each side of mesosternum. Larvae on
<i>Nasturtium</i> sp. (<i>A. J. M. Carnegie</i>). Egypt, Sudan, lowland Ethiopia,
Kenya, Uganda, Congo, Tanganyika, Nyasaland, Natal and Southern
Rhodesia] | |
| | subsp. <i>truncata</i> Enslin | |

- 2 (1) Mesosternum of ♀ with conspicuous glabrous patch each side of middle.
 [Ethiopia] subsp. **obsoleta** subsp. nov.
 — Mesosternum of ♀ densely pubescent all over.
 [Larvae on *Brassica oleracea* L. Basutoland and Cape Province]
 subsp. **himantopus** Klug

***Athalia himantopus himantopus* Klug**

Athalia himantopus Klug, 1834, *Jahrb. Ins.* 1: 293.

***Athalia himantopus obsoleta* subsp. nov.**

As defined above. Ethiopia, Addis Abada, 7,500 ft. 8 ♂, 8 ♀ (including holotype, B.M. Hym., 1.771). 30.ix-13.x.1945 (*K. M. Guichard*).

***A. himantopus truncata* (Enslin) stat. nov.**

**Athalia truncata* Enslin, 1914, *Rev. Zool. Bot. afr.* 3: 300.

(viii) Group of ***vollenhoveni***

Clypeus excised medially (Text-figs. 19, 20). Prelabium shorter than greatest measure of eye (Text-fig. 21). Antenna with only 8th and following segments broader than long. Tibial spurs long (inner hind spur longer than apical width of tibia). Claws simple. On Cruciferae.

- 1 1st tergite mainly pale with at most a black medial fleck and fore wings either bi-coloured [fuscous apex and hyaline base] or subhyaline 2
 — 1st tergite entirely black or fore wings uniformly infuscate 3
 2 (1) Fore wing subhyaline throughout. ♀ hypopygium broadly emarginate each side of middle (cf. Text-fig. 32). ♀ mesosternum uniformly pubescent. Saw (as in Text-fig. 45). 7-9 mm.
 [Larva on *Raphanus raphanistrum* L. (*J. S. Taylor*). Natal, Southern Rhodesia, Basutoland and Cape Province] ♂♀ **guillarmodi** Benson
 — Fore wings with sharply contrasted fuscous apex and hyaline base. ♀ hypopygium almost entire (cf. Text-fig. 35). ♀ mesosternum with conspicuous glabrous patch. Saw as in Text-fig. 45. 6.5-9 mm.
 [Larva on various Cruciferae including *Brassica rapa* L. and *B. oleracea* L., on which it is a major pest (*Le Pelley in lit.*, 1943). Congo, Uganda, Kenya, Tanganyika and Nyasaland] ♂♀ **sjoestedti** Konow
 3 (1) Malar space in ♀ about three-quarters distance between antennal sockets (Text-fig. 19) and in ♂ about half diameter of front ocellus. ♀ mesosternum with conspicuous glabrous patch 4
 — Malar space in ♀ about as long as distance between antennal sockets (Text-fig. 20) and in ♂ about as long as diameter of front ocellus. ♀ mesosternum without glabrous patch. (♀ hypopygium only slightly emarginate behind) 5
 4 (3) Wings subhyaline throughout. ♀ hypopygium excised on the hind margin each side of middle (Text-fig. 42). Saw as in Text-fig. 45. 6.5-8 mm.
 [Larvae on various Cruciferae including *Brassica oleracea* L. on which it is a major pest (*Le Pelley in lit.*, 1943). Ethiopia, Kenya, Uganda and Tanganyika] ♂♀ **vollenhoveni** Gribodo

- Wings fuscous throughout. ♀ hypopygium scarcely emarginate behind (cf. Text-fig. 35). Saw as in Text-fig. 42. Tibiae and tarsi vary from being only tipped apically with black to being $\pm$ suffused with brown or black all over.
 [W. Ethiopia, Kenya, Uganda and Congo] ♂♀ *segregis* Konow
- 5 (3) Eyes in ♀ further apart in front than their greatest measure and in ♂ about four-fifths (0.8 : 1.0). ♀ hypopygium scarcely emarginate behind (Text-fig. 30). Saw as in Text-fig. 45 6
- Eyes in ♀ with greatest measure slightly longer than their distance apart in front, and in ♂ their distance apart in front is about two-thirds their greatest measure (0.7 : 1). ♀ hypopygium emarginate behind (cf. Text-fig. 32). Saw as in Text-fig. 45.
 [Wings fuscous throughout. 7–8 mm. Mountains of Kenya and Southern Rhodesia] ♂♀ *fuscata* sp. nov.
- 6 (5) Head, mesonotum and underthorax clothed in long silvery pubescence. Wings subflavous to subinfusate. 7–9.5 mm.
 [Adults on *Lepidium sativum* L. which might be a host plant. Southern Arabia (Yemen and Hadramaut) and Ethiopia] ♂♀ *schweinfurthi schweinfurthi* Konow
- Pubescence on upper part of head and mesonotum fuscous; on the rest of the head and underthorax short and silvery. Wings infusate.
 [Kenya (Mt. Elgon and Aberdare Range)]
 ♂♀ *schweinfurthi atripennis* subsp. nov.

Athalia guillarmodi Benson

**Athalia guillarmodi* Benson, 1956, *South African Animal Life*, 3 : 412–413.

Athalia sjoestedti Konow

**Athalia sjoestedti* Konow, 1907, *Schwed. Zool. Exp. Kilimandj.* 8 : 4.

Athalia vollenhoveni* var. *infumata* Mocsáry, 1909, *Ann. hist.-nat. Mus. hung.* 7 : 12. **syn. nov.

**Athalia marginipennis* Enderlein, 1919, *S.-B. Ges. naturf. Fr. Berlin*, 9 : 354.

Larva : Morstatt, 1913, *Pflanzer*, 9 : 214.

Athalia vollenhoveni Gribodo

Athalia vollenhoveni Gribodo, 1879, *Ann. Mus. Stor. nat. Genova*, 14 : 346.

A. vollenhoveni Grib., Benson, 1933, *Ann. Mag. nat. Hist.* (10) 12 : 101, fig. a.

Athalia segregis Konow

**Athalia segregis* Konow, 1907, *Schwed. Zool. Exp. Kilimandj.* 8 : 4.

A. melanopoda* Enslin, 1912, *Ergebn. zentral.-Afrik. Exp.* 4 : 55. **syn. nov.

Athalia fuscata sp. nov.

♀ *Colour*. Head and thorax black or piceous. Legs yellow with black coxae, trochanters and apices of tibiae and tarsal segments. Abdomen yellow except black apex of sawsheath and $\pm$ 1st tergite. Wings uniformly infusate; stigma, costa and subcosta of fore wing black; rest of venation brownish.

Structure. Antennae 9–10 segmented with all flagellar segments longer than broad. Head with malar space shorter than distance between antennal sockets (1.0 : 1.2). Eyes with their greatest measure slightly longer than their distance apart in front.

(1.2 : 1.0). Hypopygium slightly emarginate behind (cf. Text-fig. 32). Saw with shallow teeth (c.f. Text-fig. 45). Length 5-7 mm.

Pubescence dense on head and thorax, fuscous above, pale below; mesosternum without glabrous patch.

♂ as ♀ except for sexual characters, that the clypeus and mandibles are pale, malar space about as long as 2 compound-eye facets and the distance between the eyes in front about two-thirds their greatest measure (0.7 : 1).

KENYA: Aberdare Range, 1 ♀ (Holotype B.M. Hym. 1.769), 27.x.1934 (F. W. Edwards) (Brit. Mus. E. African Exped. 1934-35); S. and E. slopes of Mt. Kenya, at edge of forest, 6,000-7,000 ft., 2 ♀, 3-12.ii.1911 (S. A. Neave) (B.M.); Teita Hills, (S.) 1 ♀, viii.1947 (van Someren) (B.M.); Nyeri, 2 ♀, x.1948 (van Someren) (B.M.).

SOUTHERN RHODESIA: Vumba Mountains 1 ♀, xii.1933 (G. Arnold) (B.M.); Vumba Mountains, Umtali, 1 ♀, 19.i.1955 (B. Stuckenberg) (Natal Mus.); Chirinda Forest, 1 ♀, 5.xi.1955 (G. Arnold) (B.M.); Chirinda Forest, Mt. Selinda, 2 ♂, 25.i.1955 (B. Stuckenberg) (B.M. and Natal Mus.).

Athalia schweinfurthi schweinfurthi Konow

**Athalia schweinfurthi* Konow, 1891, *Wien ent. Ztg.* 10 : 41.

A. schweinfurthi Konow, Benson, 1933, *Ann. Mag. nat. Hist.* (10) 12 : 100-102, fig. b.

Athalia schweinfurthi atripennis subsp. nov.

Differs from the typical subspecies (cf. Benson, 1933) in that the wings are uniformly infuscate and that the pubescence on the upper part of the head and mesonotum are fuscous instead of long and silvery as it is on the underthorax.

KENYA: Mt. Elgon, 10,500-13,000 ft., on flower heads of *Senecio elgonensis* Th. Fries, 1 ♀ (Holotype, B.M. Hym. 1.770), ii.1935 (F. W. Edwards) (B.M. E. Afr. Exped.); Mt. Elgon, 14,000 ft., 1 ♀, ii.1935 (F. W. Edwards) (B.M.); Mt. Elgon, 12,000-13,500, 1 ♂, ii.1935 (F. W. Edwards) (B.M.); Mt. Elgon, 8,800 ft., 1 ♀, 6.v.1952 (G. Arnold) (B.M.); Aberdare Range, Nyeri Track, 10,500-11,000 ft., 1 ♀, 13.v.1934 (F. W. Edwards) (B.M.). Elgon cratère, Maji Ya Moto, 3,460 m., 1 ♂, xii.1953 (N. Leleup) (Tervuren Museum).

17. SPECIES EXCLUDED FROM ATHALIINI

Athalia pelargonii* Skaife, 1954, *African Insect Life*, pp. 312-313. (Holotype in B.M., Hym. 1.757) = *Arge taeniata* (Klug), **syn. nov.

Athalia pleuritica* Forsius, 1927, *Not. ent. Helsingf.* 7 : 98. (Holotype in B.M., Hym. 1.326) = *Neacidiophora pleuritica* (Forsius), **comb. nov.

18. ABERRATIONAL AND OTHER NAMES HAVING NO SPECIFIC STANDING

Athalia glabricollis ab. *bulgarica* Gregor, 1932, *Act. Soc. ent. Bohem.* (Čsl.) 29 : 6.
= *glabricollis glabricollis*.

Athalia graellsii Dours, 1873, *Mém. Soc. Linn. Nord de France*, 3 : 20, nom. nud.

- Athalia lineolata* var. *cordatoides* Priesner, 1928, *Ent. Mitt.* **17** : 283 = *circularis circularis*.
- Athalia lineolata* var. *libertoides* Priesner, 1928 l.c. = *circularis circularis*.
- **Athalia maculata* var. *obscurata* Konow = *maculata*.
- **Athalia rosae* var. *immaculata* Konow, 1884, *Dtsch. Ent. Z.* **28** : 323 = *liberta libera*.
- **Athalia rosae* var. *obscura* Konow, 1884, *Dtsch. Ent. Z.* **28** : 323 = *cordata*.
- **Athalia rufoscutellata* var. *mocsaryi* Konow, 1891, *Dtsch. Ent. Z.* **35** : 214 = *rufoscutellata*.
- **Athalia rufoscutellata* var. *nigroscutellata* Konow, 1891, l.c. = *rufoscutellata*.
- **Athalia rufoscutellata* var. *pleuralis* Konow, 1898, *Wien ent. Ztg.* **17** : 230 = *rufoscutellata*.
- **Athalia ustipennis* var. *pectoralis* Mocsáry, 1909, *Ann. hist.-nat. Mus. hung.* **7** : 12 = *furvipennis*.
- **Athalia vollenhoveni* var. *infumata* Mocsáry, 1909, *Ann. hist.-nat. Mus. hung.* **7** : 12 = *sjoestedti* Konow.

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lugens proxima Klug, 369, 371

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sikkimensis Benson, 368, 370
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sjoestedti Konow, 378, 379
spinarum Fabr. = rosae,

tibialis Cameron = lugens proxima,
tristis Forsius = lugens proxima,
truncata Enslin = himantopus truncata,
turneri Forsius, 361, 362

umbrosa Benson, 374, 376
ustipennis Mocsáry, 373, 376

ventralis Fallén = lugens lugens,
veronicae Takeuchi = kashmirensis,
vollenhoveni Gribodo, 378, 379

xantha Benson, 364, 366

zanzibarica Forsius, 361, 362



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ON THE TYPE SPECIES OF
FOERSTER'S GENERA
(HYMENOPTERA: ICHNEUMONIDAE)

J. F. PERKINS



BULLETIN OF
THE BRITISH MUSEUM (NATURAL HISTORY)
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ON THE TYPE SPECIES OF FOERSTER'S GENERA
(HYMENOPTERA : ICHNEUMONIDAE)

BY

J. F. PERKINS *Xyf.*

British Museum (Natural History)



Pp. 383-483 ; 5 Text-figures

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ON THE TYPE SPECIES OF FOERSTER'S GENERA (HYMENOPTERA : ICHNEUMONIDAE)

By J. F. PERKINS

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SYNOPSIS

Foerster described 489 genera with no included species.

Notes are given on Thomson's treatment of certain of these genera, and it is concluded that in all cases where his spelling differed from that of Foerster, he was emending the names. The species described by Brischke and placed in Foerster's genera are discussed and synonymy given. A complete list of the type species of the Foerster genera of Ichneumonidae is included and species are placed in most of the genera to which no species have been previously assigned. In some genera, inclusions of species have been found earlier than those known to Viereck. Synonymy has been brought up to date.

INTRODUCTION

THE purpose of this paper is to select type species for those genera of Foerster 1868 : 135-221 which were described without included species in his key to genera of Ichneumonidae, and for which no previous designations have been made. For this, I have been able to visit Munich to see those parts of the Foerster collection housed in the Bayerische Staatssammlung, and I have also been able to see material of the outstanding genera of which representatives are present in the Berlin and Vienna Museums. There still remain some nineteen genera of which I have been unable to see material and of which I have as yet been unable to form any conclusions as to which species are indicated. Due to the kindness of Miss Luella Walkley, a microfilm copy of the Foerster manuscripts in the U.S. National Museum has been sent to me, but these notes unfortunately provide no further information as to the identity of these nineteen genera.

From Opinion 46 of the International Commission on Zoological Nomenclature,

the selection of type species, where already made, is fixed however ill these may agree with the original diagnosis. It is to be hoped that no reversal of this policy will be made in relation to the Foerster genera, as even in Europe the first included species are all too frequently completely different from the species included in the Foerster collection, and could not be recognized from the key. It should be pointed out, as well, that certain of the species (sometimes unique) placed in a particular genus by Foerster are quite impossible to run in his key ; in a number of cases, his genera were based on freak specimens.

Of the species contained under the genera in the Foerster collection, and the type species which have been selected for these genera, those of the *Diplazoninae* form a good example, and the position in relation to these genera is given below.

Bassus (= *Diplazon*) contained the common species usually placed in this genus by European authors, together with *bizonarius* Gravenhorst.

Promethes contained the species normally included in this genus except for those placed in certain of the segregates given below.

Bioblapsis. The single specimen placed under this name in the Munich collection is a remarkable species otherwise unknown to me. The form of the clypeus is similar to that found in *Diplazon*, but as stated by Foerster, it is broader, as is the whole face ; also the face is in greater part polished with only a trace of sculpture (at the sides of the epistoma and the orbits of the eyes) between the conspicuous punctures ; the carinae of the propodeum are similar to *Diplazon*, but the notauli are lacking on the mesoscutum ; the broad gaster has no central, longitudinal carina on tergite 1 and no transverse grooves ; tergite 2 is smooth between the clear punctures in the basal two-thirds. Type species, *Bassus flavipes* Holmgren.

Liopsis was described for *Promethes* [*Bassus*] *festivus* (Gravenhorst). This is the only European species known to me that would run to this genus in the key, and within *Promethes* is a very peculiar species. Type species, *Promethes* [*Bassus*] *sulcator* (Gravenhorst).

*Zootrephe*s contained not only *holmgreni* (Bridgman) and *rufiventris* (Gravenhorst) but also *Bassus cinctus* Gravenhorst. Type species, *Bassus* (*Zootrephe*s) *hilaris* Woldstedt.

Syrphoctonus contained the *flavolineatus* group together with *Bassus pectoratorius* Gravenhorst and a very small specimen of *Bassus tarsatorius* Panzer. Type species, *Bassus biguttatus* Gravenhorst.

Aniarophron is represented by *Zemiophora scutulata* (Hartig), a Euryproctine with tridentate mandibles. Type species, *Aniarophron niger* Szépligeti.

Phthorima is represented by *signatus* Gravenhorst. Type species, *Phthorima* [*Bassus*] *compressa* (Desvignes).

Enizemum is represented by *ornatus* (Gravenhorst), which has been selected as the type species of the genus.

Homotropus contained the *pictus* and *elegans* groups of species. Type species, *Homocidus* [*Bassus*] *elegans* (Gravenhorst).

Thus *Bioblapsis*, *Liopsis*, *Zootrephe*s, *Aniarophron* and *Phthorima* are used for concepts which do not agree with the original material of Foerster. However, the genera of the *Diplazoninae* have been better recognized than in other subfamilies.

A further problem that has caused considerable trouble is the emendations made by Thomson in his *Opuscula Entomologica* when taking up the Foerster names. I agree completely with Miss Walkley's conclusion that the Thomson usage was purely as emendations of the Foerster names (Walkley 1958). Neave, 1939-40, also lists these names as emendations.

It is as well, perhaps, to give a brief account of the manner in which Thomson used this work of Foerster. References are given to relevant pages in Thomson's *Opuscula Entomologica*. Although Foerster's paper appeared in 1868, Thomson made no use of it until 1874. Thomson 1874 : 589 explains his reason for his action by the fact that Foerster had stated in his introduction that he proposed to give full descriptions of the genera later, and in particular to fix type species ; however, Thomson now proposed to try and recognize these genera though finding this very difficult due to the lack of clarity and precision in the opposed characters of the key, and he suggested that certain of his own genera were the same as certain of Foerster's genera. Thomson only took up a limited number of these names where he thought that they would be taxonomically useful (1889 : 1361), and when he placed them as subgenera he made them agree in gender with the generic name, or with the genus of which he considered them to be segregates (cf. his treatment of the Plectiscinae and *Mesoleius*). Thomson 1889a : 1408 states that through Schmiedeknecht's work on the Pimplinae, he has an insight into the Foerster genera and proceeds to use them, though some are misspelled.

Thomson discussed Foerster's work at some length in his introduction to *Mesoleius* (1892a : 1870-1), again pointing out that many of Foerster's segregates are based on superficial characters. Of *Aeolometis* he states that Dr. Kriechbaumer had sent him the type of that genus, the only type that he examined, which showed that the specimen was a *Scolobates italicus* with the femur eaten out by *Dermestes*. This genus was used by Thomson but misprinted *Aelometis* which has been regarded by certain workers as a name distinct from *Aeolometis* for nomenclatorial purposes. He then proceeds to use many of the Foerster names making them masculine to agree with *Mesoleius*. Thomson never quoted any author for these Foerster names and thus they appear in the same format as his own new genera. This seems to have been one of the main reasons for subsequent authors having assumed that Thomson did not recognize the Foerster names as valid and was proposing new names based on but distinct from those of Foerster. It appears to me, therefore, that if any of these names are regarded as new genera of Thomson, then all should be so accepted. No author has gone as far as this, but some have accepted that in certain cases Thomson was actually using the Foerster genera. The position, however, is really placed beyond doubt by the statement quoted by Miss Walkley in relation to the Diplazoninae where Thomson 1890 : 1462 stated that while Holmgren and Gravenhorst placed all the species in *Bassus*, Foerster made many new genera, some of the names of which he (Thomson) was using.

Below is given a list of the names which are affected by the applications of the above considerations, together with types selected by Thomson for genera of Foerster in his various introductions to groups and genera and which have been overlooked. It also includes overlooked inclusion of species given by Thomson.

Aeolometis Foerster

Type species, *Scolobates italicus* Gravenhorst

Thomson 1892a : 1870 (as *Aelometis* [sic] Thomson 1894a : 2034)

Anilasta [sic] Foerster Thomson = *Anilastus* Foerster

Type species, *Campoplex ebeninus* Gravenhorst

Morley 1913 : 493

Apechtis [sic] Foerster Thomson = *Apechthis* Foerster*Aphanoroptra* [sic] Foerster Thomson = *Aphanoroptrum* Foerster

Type species, *Aphanoroptra ruficornis* (*Pimpla* Grav.) [lapsus pro *Lissonota*] = *Aphanoroptrum abdominalis* (Gravenhorst)

Thomson 1877 : 736 (Monobasic)

Asthenarus [sic] Foerster Thomson = *Asthenara* Foerster

Type species, *Asthenarus crassifemur* Thomson (Monobasic)

Thomson 1889a : 1437

Astiphrommus [sic] Foerster Thomson = *Astiphromma* Foerster*Barytarbus* [sic] Foerster Thomson = *Barytarbes* Foerster*Colocnema* Foerster

Type species, *Cryptus rufinus* Gravenhorst

Thomson 1874 : 590

Diaparsus [sic] Foerster Thomson = *Diaparsis* Foerster*Dyspetus* [sic] Foerster Thomson = *Dyspetes* Foerster

Type species, *Tryphon praerogator* (Linnaeus) ; Gravenhorst, 1829 nec Linnaeus

Thomson 1883 : 899

Entelechius [sic] Foerster Thomson = *Entelechia* Foerster*Entypomus* [sic] Foerster Thomson = *Entypoma* Foerster*Epachtus* [sic] Foerster Thomson = *Epachthes* Foerster*Euryproctus* Holmgren

Type species, *Mesoleptus annulatus* Gravenhorst, 1829

Thomson 1894 : 1985

This type designation has previously been overlooked.

Gonotypa [sic] Foerster Thomson = *Gonotypus* Foerster*Himertus* [sic] Foerster Thomson = *Himerta* Foerster*Hodostatus* [sic] Foerster Thomson = *Hodostates* Foerster*Holocremna* [sic] Foerster Thomson = *Holocremnus* Foerster*Homotropus* Foerster Thomson

Thomson, 1890 refers species definitely to this genus as follows :—

p. 1475 *signatus*, p. 1484 2-*guttatus*, p. 1487 *signatus* and *pallipes*.

In the key to genera, p. 1465, he refers to the genus as *Homotropus* but on p. 1488 the name is printed as *Homoporus*. This seems to be an obvious lapsus since he states (p. 1464) that he is taking up certain of the Foerster genera. Thomson had already

used *Homoporus* for a genus of Chalcids and Morley proposed the new name *Homocidus* for the Ichneumonid *Homoporus*. The type species for both these genera, if considered available names, must therefore be the same, *H. elegans* (Gravenhorst) by designation of Viereck, 1912 (cf. Walkley 1958 : 57) ; the selection of *pectoratorius* (Gravenhorst) for *Homoporus* by Viereck, 1914 is invalid.

The selection by Davis 1895 of *bicapillaris* (Walsh) as the type species of *Homotropus* is anyway invalid as Thomson had already referred species definitely to this genus, even if it is not accepted that *Homoporus* was a lapsus.

I accept *Homoporus* as being a lapsus for *Homotropus* and that *elegans* (Gravenhorst) is the type species of *Homotropus*. If this view is not upheld, then the type must be chosen from *signatus* (Gravenhorst), *biguttatus* (Gravenhorst) and *pallipes* (Holmgren).

Homoporus Thomson lapsus for *Homotropus* Foerster

Labrossytus [sic] Foerster Thomson = *Labrossyta* Foerster

Type species, *Ichneumon scotopterus* Gravenhorst (Monobasic)

Thomson 1894 : 2001

Lagarotus [sic] Foerster Thomson = *Lagarotis* Foerster

Lathrolestus [sic] Foerster Thomson = *Lathrolestes* Foerster

Lathrostiza [sic] Foerster Thomson = *Lathrostizus* Foerster

Laphyrosopus [sic] Foerster Thomson = *Laphyrosopus* Foerster

Type species, *Tryphon gorskii* Ratzeburg

Viereck 1914 : 87

Olesicampa [sic] Foerster Thomson = *Olesicampe* Foerster

Omorga [sic] Foerster Thomson = *Omorgus* Foerster

Pammicrus [sic] Foerster Thomson = *Pammicra* Foerster

Parabatus [sic] Foerster Thomson = *Parabates* Foerster

Type species, *Parabatus nigricarpus* Thomson

Endelein 1912 : 106

Perispudus [sic] Foerster Thomson = *Perispuda* Foerster

[*Phaestus* Foerster

Type species, *Phaestus heterocerus* Thomson. (Monobasic)

Thomson 1894 : 2017]

Phobetis [sic] Foerster Thomson = *Phobetis* Foerster

Type species, *Tryphon fuscicornis* Holmgren

Viereck 1914 : 115

Phobocampa [sic] Foerster Thomson = *Phobocampe* Foerster

Phthorimus [sic] Foerster Thomson = *Phthorima* Foerster

Polycinetus Foerster Thomson emendation pro *Polycinetis* Foerster q.v.

Polyrhysius [sic] Foerster Thomson = *Polyrhysia* Foerster

Polytreres [sic] Foerster Thomson = *Polytrera* Foerster

[*Proedrus* Foerster

Type species, *Hemiteles luteolator* Gravenhorst

Thomson 1889 : 1360.]

Rhaestus [sic] Foerster Thomson = *Rhaestes* Foerster

Type species, *Grypocentrus rufipes* Holmgren (Monobasic)

Thomson 1883 : 924

Saotus [sic] Foerster Thomson = *Saotis* Foerster

Thomson 1883 : 933-944. (Many species)

Type species, *Mesoleius* (*Saotus*) *brevispinas* Thomson

Viereck 1914 : 130

Scopesus [sic] Foerster Thomson = *Scopesis* Foerster

Spudaeus [sic] Foerster Thomson = *Spudaea* Foerster

Type species, *Tryphon leucostomus* Gravenhorst

Viereck 1914 : 136

The Brischke species, *Trematopygus* (*Spudaea*) *clypearis* Brischke, 1888 is invalid as type species, as Thomson had already used the genus

Synodytes [sic] Foerster Thomson = *Synodites* Foerster

Thymarus [sic] Foerster Thomson = *Thymaris* Foerster

Already used by Brischke

Type species, *Thymaris pulchricornis* Brischke

Trichocalymmus [sic] Foerster Thomson = *Trichocalymma* Foerster

Already used by Woldstedt

Type species, *Trichocalymma bipunctatum* Woldstedt

Zemiophorus [sic] Foerster Thomson = *Zemiophora* Foerster.

Zootrephus [sic] Foerster Thomson = *Zootrephes* Foerster

Already used by Woldstedt

Type species, *Bassus* (*Zootrephes*) *hilaris* Woldstedt

FOERSTER GENERA FIRST USED BY BRISCHKE

Considerable confusion still exists in the identity of certain of the Foerster genera which were first used by Brischke for species described by himself. This has been made worse by the loss of the Brischke types. In order to try to rationalize the position, some notes on the possible interpretation of these species are given below.

Bachia

Type species, *Phygadeuon* (*Bachia*) *testaceipes* Brischke = *Endasys* Foerster sec Habermehl and Schmiedeknecht.

Bathymetis

Type species, *Phygadeuon* (*Bathymetis*) *cylindricus* Brischke.

This species has never been recognized by any author, and is omitted by Schmiedeknecht. The description gives no clue at present to the possible identity of the species.

Charitopes

Type species, *Hemiteles* (*Charitopes*) *chrysopae* Brischke.

From Brischke's description, this species would agree best with a specimen sent to the British Museum, named by Schmiedeknecht as *Hemiteles flavigaster* Schmiedeknecht. It is closely related to *Hemiteles brunneus* Morley (syn. *H. hemerobii* Pfankuch,

syn. n.) and belongs to a group of species which seem all to be parasites of *Hemerobius*.

Dimophora

Type species, *Dimophora robusta* Brischke.

This Cremastine appears to have been correctly recognized.

Erigorgus

See notes in the general list of types, p. 412

Gambrus

Type species, *Gambrus (Cryptus) maculatus* Brischke.

From the description it would appear that this was probably the male of *Gambrus ornatus* (Gravenhorst), and anyway seems to agree best with some species of *Gambrus* auctt. if considered to be distinct from *ornatus*.

Hypocryptus

Type species, *Mesoleptus (Hypocryptus) testaceicornis* Brischke.

This species has never been placed and I have been unable to recognize any species as probably agreeing with the description.

Ischnobatis

Type species, *Thersilochus* [emend. pro *Ter*-] (*Ischnobatis*) *stramineipes* Brischke (Monobasic). Brischke 1880 : 194.

Porizon nigrifulus Gravenhorst ?, placed by Brischke in *Ischnobatis*, is not available for selection as type and thus Viereck's selection of this species is invalid.

T. (I.) stramineipes was originally reared from galls of *Pontania* and appears to be the species that can be obtained fairly readily from the *Balaninus* which inhabits these. As at present understood, *Luchatema* Walkley, 1956 is a synonym of this genus.

Kaltenbachia

Type species, *Kaltenbachia ornatus* (Gravenhorst).

Brischke quoted ? *ornatus* Gravenhorst as belonging to this genus and hence placed no determined species in it. However, Dalla Torre 1902 : 552 quotes *ornatus* Gravenhorst as belonging to this genus and hence this should be taken as the reference for the first included species. *Kaltenbachia*, therefore, remains as a synonym of *Gambrus*. The species placed by Schmiedeknecht in *Kaltenbachia* should therefore be transferred to *Nyxeophilus* Foerster.

Medophron

Type species, *Medophron niger* Brischke.

This species has been synonymized with *Phygadeuon afflictor* Gravenhorst, and might well have been that species. It is very probable that when the various segregates recognized in the North American fauna are investigated in relation to the European, that *Medophron* will be considered a distinct genus.

Naetes

Type species, *Hemiteles (Naetes) rufus* Brischke, 1892.

I believe this species to be a synonym of *Hemiteles hadrocerus* Thomson, 1884

syn. n. For the present, I regard this genus as a synonym of *Orthizema*; neither has come into usage and therefore page priority is accepted.

Notosemus

Type species, *Notosemus dives* Brischke, 1887 = *N. bohemani* (Wesmael, 1855).

Orthizema

Type species, *Hemiteles (Orthizema) ornatus* Brischke, 1890.

I believe this species to be a synonym of *Hemiteles subannulatus* Bridgman, 1883 **syn. n.**; probably *H. triannulatus* Thomson, 1884 is also the same species.

Phradis

Type species, *Thersilochus (Phradis) brevis* Brischke.

I do not know this species.

Phyzelus

Type species, *Phyzelus fasciatus* Brischke.

I believe this species to be *Phyzelus flagitator* (Rossi) **comb. n. syn. n.**, which has been placed in *Acanthocryptus* by Schmiedeknecht who, although discussing *Phyzelus*, retained all the species in the one genus. I consider these two genera to be distinct.

Thaumatotypus

Type species, *Thaumatotypus femoralis* Brischke, 1881.

Syn. *Pezomachus myrmecinus* Thomson sec Roman and Pfankuch.

This species belongs to the group to which the name *Thaumatogelis* Schmiedeknecht has been applied.

Thymaris

Type species, *Thymaris pulchricornis* Brischke.

Thysiotorus

Type species, *Hemiteles (Thysiotorus [sic]) brevipennis* Brischke.

This species has been synonymized with *Hemiteles hemipterus* (Fabricius) Gravenhorst. Both *Chamerpes* and *Phyrtus* have the same type species. These latter have been synonymized by Townes with *Eriplanus* but this seems to me to be doubtful.

It seems incredible that Brischke could ever have intended to use the name *Thysiotorus* for this segregate, for *Thysiotorus* as used by Foerster is at once recognizable as referring to the group of species placed under this name by Cushman 1920 including *Leptocryptus lamina* Thomson and the related species of the European fauna. It appears to me much more likely that Brischke wrote *Physiotorus* as a lapsus for *Phyrtus*, which, after all, is in the section dealing with brachypterous forms in Foerster's key. Further, many specimens of *hemipterus* would run to *Phyrtus*.

Of the three new genera of brachypterous Phygadeuontoidae described by Foerster in 1868, the specimens standing under those names in the part of the Foerster collection in Munich were as follows:—

Pezoporus—*Theroscopus hemipterus* (Fabricius).

Phyrtus—*Plectocryptus scansor* Thomson ♀ (= *griseus* Gravenhorst ♂).

Chamaezelus—*Stibeutes heinemanni* Foerster.

A further name, attributed by Brischke to Foerster appears as a synonym of *Orthopelma* Taschenberg, namely *Tanytelma* (Brischke, 1881 : 348). Since the status of names first appearing in synonymy is likely to continue to be a subject of controversy, it is thought advisable at least to call attention again to this name.

GENERA OF WHICH NO SPECIMENS HAVE BEEN SEEN

In spite of the search made in the remaining parts of the Foerster Collection, no specimens have been seen representing the following genera, and it has so far been impossible to suggest what species Foerster may have had before him. It is therefore thought inadvisable to select type species for these genera at the present time. They are listed below under the family group name employed by Foerster.

Phygadeuontoidae

Epiphobus

Porizonoidae

Epistathmus

Campoplegoidae

Asinamora

Olethrodotis

Dioratica

Pantropa

Dolophron

Rhexineura

Tryphonoidae

Alcochera

Phagesorus

Aselasma

Trysicampe

Camporychus

Xenonastes

Hyperbatus

Zapedias

Nythophona

Zaphthora

Paraplesius

Names which are homonyms have not been considered as they need have no standing in nomenclature, viz. :

Adranes

Ithagenes

Daspletis

Plesiomma

Hybristes

Tolmerus

DESCRIPTIONS OF NEW SPECIES

In four cases, it has been impossible to determine the species placed by Foerster under his genus, and these are described as new. Three of the genera are then considered to be synonyms, *Stygera* of *Cremnodes*, *Pemon* of *Lysibia* and *Gunopaches* of *Phygadeuon*, though when, as seems probable, this latter genus is split up, it is possible that *Gunopaches* may constitute a recognizable segregate.

Subfamily CRYPTINAE

Gunopaches crassus sp. n.

(Text-fig. 1)

Head : temples roundly narrowed behind the eyes ; POL : OOL 2 : 0.6 ; malar space long, length of malar space : breadth of base of mandible = 6 : 5 ; genal sulcus not impressed, represented by a line of coriaceous sculpture ; genal carina meeting the hypostomal carina far behind

FIG. 1. *Gunopaches crassus* sp. n. ♀

the base of the mandible ; clypeus with two small, apical teeth ; epistoma weakly differentiated and weakly raised ; frons sparsely punctate, vertex weakly coriaceous or smooth, the genae polished, clypeus with scattered punctures, face with scattered, shallow punctures, coriaceous and in part tending to striae ; antenna thickened apically, approximately 17-segmented, segments 3, 4 and 5 in the proportion 15 : 16 : 11.

Thorax : pronotal groove somewhat transstriae ; notauli distinctly impressed to about one-fifth ; disc of mesoscutum coriaceous, and together with the central lobe, having shallow, ill-defined punctures, the lateral lobes polished with faint, sparse punctures ; scutellum punctate

apically and laterally, the scutellar fovea with longitudinal striae ; sternauli deeply impressed ; the pleura polished, with the disc very weakly alutaceous, becoming somewhat rugose-punctate anteriorly ; subalar prominence short, rounded, merging into a conspicuous, posterior carina before and above the subalar pit ; sternum short, weakly, shallowly punctate, the epicnemial carina strong, the mesolcus broadly closed posteriorly ; propodeum with conspicuous areae, the area superomedia a regular hexagon and polished, the area dentipara with the posterior carina strongly developed but not produced into an apical tubercle or spine, weakly sculptured, the area petiolaris with coarse, coriaceous sculpture which is very weak anteriorly and becoming strong posteriorly, the posterior lateral areae rugose ; metapleurae polished, with a few, shallow, scattered punctures and somewhat striate posteriorly ; metapleural carina strongly developed. Front wing with vein $3m$ translucent, base of cell $2M$ a little longer than Cu_1b , Cua a little postfurcal. Hind wing with the apical abscissa of Cu_1 faint or absent, Cu_1 and cua subvertical and hardly angled. Hind leg with the femur not conspicuously thickened, tibia fat, narrowing apically and strongly narrowing basally, spurs subequal, the apical tarsal segments in the proportions 10 : 3 : 9 : 11 ; front tibia thickened, but not conspicuously inflated.

Gaster with tergite 1 having weak carinae to beyond the spiracles, the postpetiole somewhat raised centrally, coriaceous but tending to become longitudinally striate apically ; tergite 2 weakly, coarsely coriaceous and with scattered hairs laterally and subapically ; the following segments polished, tergite 3 with a sub-basal band of hairs and a subapical row of hairs, tergites 4 and 5 sparsely hairy ; laterotergite 2 moderately broad, inflexed, of 3 weakly inflexed ; ovipositor sheaths, seen ventrally : first hind tarsal segment = 7 : 6.

Colour : black ; tergite 2 sordid testaceous, scape sordid testaceous beneath ; legs sordid testaceous with at least the hind coxa, hind tibia basally and apically and the hind tarsus fuscous.

Length : 3 mm.

♂. Unknown.

HOLOTYPE. ♀. Hym. 3b. 2058. SWEDEN : Skåne ; Degeberga, 8.vii.1938 (J. F. and D. M. S. Perkins) (B.M. Coll.).

PARATYPES. SWEDEN : Blekinge ; Sjöarp, 2 ♀, 28.v.1953 (K. J. Heqvist.) (B.M. Coll.). ? GERMANY : 1 ♀ (under *Gunopaches* in Foerster Coll. in Munich Museum), 1 ♀ (under *Pantolispa* in Foerster Coll. in Berlin Museum).

This species is distinguished by the clypeus having two teeth, vein 3 rm unpigmented, the propodeum short and tergites 1 and 2 with coriaceous sculpture.

Pemon proximum sp. n.

(Text-fig. 2)

Having the generic characters given for *Haplaspis* Townes 1944. Related to *Hemiteles nanus* Gravenhorst 1829.

Head : the vertex and frons almost without sculpture, strongly shining ; occipital carina at most faintly visible centrally ; genal carina meeting the hypostomal carina immediately behind the base of the mandible ; antenna with 24 segments, antenna of the type without the apical segments.

Thorax : pronotum laterally with only very short striae posteriorly and sparse punctures towards the upper margin ; mesopleurum with three or four striae in front of the pit, with weak, scattered punctures anteriorly, and the sternaulus only extending to about two-thirds the length of the mesopleurum ; mesosternum weakly, though rather closely punctate and shining ; propodeum dorsally and apically strongly shining, with irregular rugae associated only with the carinae, the lateral carina absent ; metapleurum shining, in greater part without sculpture.

Gaster shining, with tergite 1 subapically striate punctate, rather broadly smooth and polished apically ; tergite 2 with a crenulate, transverse furrow at two-thirds the distance from the base, polished behind this, coarsely punctate basally, the punctures in part fusing into striae, the punctures becoming sparser towards the furrow ; tergite 3 with a weak transverse impression, sparsely, finely punctate basally ; the following segments without clear punctures.



FIG. 2. *Pemon proximum* sp. n. ♀.

Colour : black to piceous ; scape and pedicel in greater part pale testaceous ; mandibles yellow with the teeth black ; palps white ; hind angle of pronotum and the tegula yellow ; gaster with the apical segments red laterally, the tergites narrowly dull reddish apically, the last two tergites white-membranous apically ; legs pale testaceous, the front and middle coxae, trochanters and trochantelli yellow, the hind coxa usually infusate basally, hind trochanter and trochantellus yellow, hind femur weakly infusate dorsally, hind tibia infusate apically and the last hind tarsal segment infusate.

Length : 4 mm.

HOLOTYPE. ♀. EUROPE: type locality unknown (*A. Foerster Coll.*) (Berlin. Humboldt University Zoological Museum).

PARATYPE. ENGLAND: Suffolk; Monks' Soham, ♀, 26.viii.1929, on window (*C. Morley*) (B.M. Coll.).

Very closely related to *Haplaspis ceylonensis* Kerrich from Ceylon, and differing from that species in the interrupted occipital carina, the transverse area superomedia, the absence of striae towards the base of the petiole, centrally, and in the piceous, not yellow, clypeus.

This genus belongs to that group which has the transverse pronotal groove conspicuously interrupted centrally. A further point of interest in relation to *Lysibia* (syn. *Pemon*, *Haplaspis*) is that the long malar space is without the usual longitudinal band of coriaceous sculpture.

Stygera Foerster

Possesses the characters given for *Caenomeris* Foerster by Townes 1944, of which it is a synonym. It seems most probable that both are congeneric with the strongly brachypterous *Cremnodes* Foerster and for the present I regard both *Caenomeris* and *Stygera* as synonyms of *Cremnodes*.

It is possible that the Foerster specimen may be distinct specifically from the individual described herewith, but as the propodeal carinae are malformed, it is advisable not to describe it at the present time.

Stygera rufipes sp. n.

(Text-fig. 3)

Head: temples large, subparallel directly behind the eyes, then convexly narrowed; malar space long, malar space: breadth of base of mandible = 3:2; genal carina meeting the hypostomal carina conspicuously behind the base of the mandible; mandibles rather broad, conspicuously narrowed apically, and with the upper tooth longer and larger than the lower; clypeus produced apically into a strong central tooth, punctate basally; epistoma hardly differentiated; frons, temples and genae polished, the malar space coriaceous with sparse punctures, the face coriaceous, more weakly so centrally and towards the eyes, with scattered punctures; interantennal tubercle strong; antenna with 18 segments, the segments of the flagellum somewhat thickened apically, narrowed and somewhat elongate basally; flagellar segments 1, 2 and 3 in the proportions 15:12:10.

Thorax: mesoscutum and scutellum with very shallow, sparse punctures, evenly hairy; scutellar fovea weakly striate; mesopleurum shining, glabrous centrally, with very weak sculpture anteriorly; sternaulus deeply impressed anteriorly, somewhat longitudinally striate posteriorly; epicnemial carina distinct and well-developed; mesosternum similar in sculpture to the mesopleurum, and rather short; propodeum with the area superomedia fused with the area petiolaris and abruptly descending as in Stilpnines; costula absent, the remaining carinae distinct; area petiolaris polished, area dentipara weakly, coarsely coriaceous; metapleurum rugose beneath. Wings as described for *Caenomeris*, with the venation somewhat retracted towards the base of the wing. Legs rather thin; hind leg with the coxa coriaceous, femur not thickened, tibia little thickened, narrowed basally, the spurs subequal, rather long, as long as or a little longer than the second hind tarsal segment.

Gaster: tergite 1 subparallel-sided with the spiracles a little prominent, the petiole weakly bicarinate to the spiracles, postpetiole raised centrally; tergite 1 coriaceous laterally and apically, the sculpture tending towards longitudinal striae, with a subapical row of hairs and

scattered hairs laterally ; tergite 2 rather broad, faintly, coarsely coriaceous, sparsely hairy laterally, with one or two hairs subbasally, a row of sparse hairs centrally and a row of sparse hairs at the apical two-thirds ; laterotergites of segment 2 somewhat narrow ; rest of the gaster narrowing from the apex of tergite 2 to the apex of the gaster, polished ; tergite 3 with sparse



FIG. 3. *Stygera rufipes* sp. n. ♀.

hairs laterally and rows of sparse hairs at one-third and two-thirds from the base ; the following segments sparsely hairy, on tergite 4 reduced to a transverse row centrally ; ovipositor sheaths a little shorter than the first segment of the hind tarsus.

Colour : black ; the scape, beneath, and the basal segments of the flagellum dirty-pale testaceous ; tegulae yellow ; legs pale testaceous, the hind tibia somewhat infusate basally and apically and the hind tarsi weakly infusate ; tergite 2 pale testaceous, infusate laterally, tergite 3 pale testaceous, infusate laterally and apically.

Length : 3 mm.

HOLOTYPE. ♀. Hym. 3b. 2059. ENGLAND: Hants; Brockenhurst, 7.vi.1938 (R. B. Benson) (B.M. Coll.).

Differs from *Caenomeris nigripes* (Ashmead) (syn. *polita* Ashmead) in the pale testaceous legs and middle of gaster; in the more elongate basal flagellar segments (of *nigripes* 10:10:7); in the postanellus being distinctly longer than the malar space, whereas in *nigripes* it is at most as long as the malar space; in tergite 2 being weakly sculptured basally. I wish to thank Miss Luella Walkley for giving me the opportunity of examining a specimen of *Caenomeris nigripes* (Ashmead).

Subfamily CTENOPELMATINAE

Terozoa Foerster

This genus is related to *Rhorus* and *Ischyrocnemis*, but as stated by Foerster in his key to genera, has the teeth of the very broad mandible more or less divided so that it appears to be quadridentate, the inner teeth being shorter than the subequal, outer teeth.

Both *Terozoa* and *Ischyrocnemis* have very well developed epomiae and simple claws. *Ischyrocnemis* has no glymmae but a well developed, apical thorn on the front tibia; *Terozoa* has deep glymmae and a minute, apical thorn.

Terozoa quadridens sp. n.

Head transverse, rather narrow but with the temples a little diverging behind the eyes; occipital carina complete, genal carina incomplete, the postgena somewhat hollowed out ventrad where it is irregularly, obliquely striate; malar space rather long, about two-thirds the width of the base of the mandible; clypeus rather long, rounded apically and roundly, inwardly inflexed apically, not divided from the face which is somewhat incised centrally below the antennal sockets; frons centrally carinate; face and clypeus punctate, tending to rugose-punctate centrally, malar space rugose-punctate, the punctures becoming sparser on the gena, gradually becoming sparse and small on the temples and vertex, the frons more distinctly punctate than the temples; base of mandible weakly tuberculate, mandible with four apical teeth; antennae of type damaged.

Thorax with rather close, silvery, recumbent pubescence; pronotal collar moderate, rather weakly differentiated, epomiae very strong; mesoscutum with the notauli barely perceptible anteriorly; scutellum raised, the lateral carinae only weakly represented basally; subalar prominence weak, rounded; episternal scrobe shallow, close to the mesopleural suture; epicnemial carina absent dorsally, only reaching a little above the line of the lower angle of the pronotum where it is angled, absent centrally and strongly raised into high lobes on either side of this; propodeum strongly areated with the rather small hexagonal area superomedia having the anterior carina erased, dentiparal area truncate apically and with no costula, petiolar area with a weak, central carina, the submetapleural carina somewhat raised anteriorly; pronotum, mesoscutum and scutellum finely punctate, mesepisternum more coarsely punctate, the punctures becoming finer dorsad, and finer and closer on the sternum, the speculum polished, propodeum in part smooth, irregularly rugose in the area superomedia and area petiolaris, metapleurum finely punctate. Front wing with the stigma moderate, receiving *Rs* + *2r*, which is curved basally, before the middle; cell *2Rs* very shortly petiolate, rhomboidal, a little broader than high and receiving vein *2mcu* at the outer quarter; *2mcu* outwardly bent between the two fenestrae and with a stub of a vein projecting; cell *1M* with the sides converging anteriorly; vein *Cu₁b* posteriorly, inwardly curving, but *Cua* posteriorly, outwardly curved. Hind wing with six wing hooks; apical abscissae of *Rs*, *M*, *Cu₁* and *1A* all discernible almost to the margin of the wing; basal abscissa of *Rs* longer than *1rm* and not curved basally; *M* + *Cu₁* weakly

curved; nervellus a little postfurcal with Cu_1 subequal to cua . Legs with the front trochanter long, front tibia with a minute apical tooth; hind trochanter, viewed dorsally, subparallel-sided except at the base, last hind tarsal segment shorter than segment 3, inner hind tibial spur subequal to segment 2 of tarsus, the outer spur a little shorter than the inner; claws impectinate, rather broad and shortly curved apically.

Gaster shining with rather close, silvery, decumbent pubescence, petiolate; tergite 1 with spiracles behind the middle, sternum 1 free and not quite reaching the line of the spiracles, lateral carina extending to the apex of the segment where it is very strong, but is weak just behind the spiracle, the petiole with a raised, flattened, central area but the postpetiole evenly, transversely convex; tergite 2 with the thyridiae rather large and subbasal; laterotergites not observable in the type, the spiracle of tergite 3 little removed from the lateral margin of the segment.

Colour: black; the clypeus sharply margined with yellow apically, vertex with a pair of yellow, orbital spots; front and middle femora marked with dirty yellow anteriorly, the tibiae in greater part dirty yellow and the tarsi in part pale; hind leg black with the spurs dirty white; tergite 1 red apically, the remaining tergites and the claspers red.

HOLOTYPE. ♂. ? GERMANY. (*A. Foerster Coll.*) (Munich, Bayerische Staats Sammlung).

LIST OF TYPE SPECIES OF THE FOERSTER GENERA OF ICHNEUMONIDAE

It has been found that certain arbitrary decisions have had to be made in order to bring some consistency into the way in which the type species are arrived at. The case of the Thomson usage of names has already been discussed, but further to this, it should be pointed out that the previous treatment of these names can vary considerably in any one work; for instance, Viereck 1914 treats certain names as emendations, others as new generic names, and where the spelling agreed with the original spelling of Foerster, he assumed Thomson was directly using the Foerster name. Schmiedeknecht, Roman and Cushman, in particular, have tried to make out the actual species which they thought Foerster had before him; where these interpretations differed from the concept of following the first included species, they have considered such type designation as invalid. This position has been clarified by the Paris and Copenhagen decisions of the International Commission on Zoological Nomenclature.

Following the Copenhagen decision, I have excluded as available for type species of genera those cases where an author has written some such phrase as "species B *would* belong to genus A", showing some doubt about placement of the species; this, in actual fact, causes no changes of type species. Naturally any name with which a question mark is associated, or with such qualifications as "may belong" or "perhaps belongs to genus A" is rejected.

In cases where two competing generic names have not previously been used, I have naturally accepted page priority. However, in a number of cases, names with no previously included type species would by page and place priority take precedence over other names which have been used for a longer or shorter time. In these cases I have followed the precept of stability and first reviser, and have synonymized these genera with the names in current use.

Sometimes, Foerster used a name of his own in place of a well established genus. This was a puzzle to me until I found the reason in Schmiedeknecht 1888: 439.

Here, under *Meniscus*, he states that Foerster proposed new names for genera which were used in plants. In some cases, he took as homonyms names having the same derivation. I have therefore considered that in these cases, given in Foerster's index, the Foerster names are new names not new genera, and therefore must have the same type species as the genus which they were supposed to replace.

In the following alphabetical list of genera the page associated with the genus heading is that in Foerster 1868, but where the genus was described by Foerster in some other publication, it is preceded by the relevant date. Where the genus is now regarded as being a synonym, the valid name follows an "equals" sign; the same applies to the type species. Where a name is preceded by syn., the name is a synonym of the principal genus. The authority for the first synonymizing of genera and species is included with date and in brackets, e.g., = *Alegina* Foerster, 1868 (Townes 1944).

The papers which appeared relevant of Brischke, Kriechbaumer, Tschek and Schmiedeknecht have been examined in order to trace overlooked first inclusions of species in the Foerster genera. A certain number of such inclusions has been found and no doubt as time goes on, still further cases will be discovered.

***Aclastus* : 175.**

Type species, *Aclastus rufipes* Ashmead, 1902

Included by Ashmead 1902 : 187 (Monobasic)

= *Gnyptomorpha* Foerster, 1868 (Roman 1925, Townes 1944)

= *Gnyptomorpha rufipes* (Ashmead, 1902)

***Acrolyta* : 174.**

Type species, *Acrolyta emprethiae* Ashmead, 1896

Included by Ashmead 1896a : 209 (Three species)

Designated by Viereck 1914 : 4

= *Acrolyta nigricapitata* (Cook & Davis, 1891) (Townes 1944)

***Actenonyx* : 195 nec White, 1846.**

Type species, *Ichneumon marginatorius* Fabricius, 1793

Included by Schmiedeknecht 1911 : 2303 (Monobasic)

= *Exenterus* Hartig, 1838 (Townes 1944)

= *Exenterus marginatorius* (Fabricius, 1793)

***Adexioma* : 206.**

Type species, *Adexioma angularia* Davis, 1898

Included by Davis 1898 : 284 (Monobasic)

= *Lamachus* Foerster, 1868 (Townes 1945)

= *Lamachus angularius* (Davis, 1898)

***Adiastola* : 180.**

Type species, *Adiastola americana* Howard, 1897

Included by Howard 1897 : 54 (Monobasic)

= *Mastrus* Foerster, 1868 (Townes 1944)

= *Mastrus americanus* (Howard, 1897)

Adranes : 205 nec Leconte, 1850.

Aenoplex : 176.

Type species, *Aenoplex betulaecola* Ashmead, 1896

Included by Ashmead 1896a : 208 (Monobasic)

= *Mastrus* Foerster, 1868 (Townes 1944)

= *Mastrus pilifrons* (Provancher, 1879) (Townes 1944)

Aeolometis : 207.

Type species, *Scolobates italicus* Gravenhorst, 1829

Included by Thomson 1892a : 1870 (Monobasic)

syn *Tachyporthus* Foerster, 1868

= *Aeolometis italicus* Gravenhorst, 1829

Meyer 1936 and Townes 1945 consider this genus a synonym of *Mesoleius* Holmgren.

Agasthenes : 178.

Type species, *Hemiteles varitarsus* Gravenhorst, 1829 (By present designation)

= *Agasthenes varitarsus* (Gravenhorst, 1829) **comb. n.**

This agrees with the interpretation by Roman 1925 : 13 who suggested that *Hemiteles varitarsus* might belong here. *Agasthenes* includes the European species placed by Roman in *Astomaspis* in the above paper, with the exception of *nanus* (Gravenhorst, 1829), which is the type species of *Lysibia* Foerster, q.v.

Agrothereutes 1850 : 79.

Type species, *Pezomachus abbreviator* (Fabricius) ; Gravenhorst, 1829

Included by Foerster 1850 : 81 (Two species)

Designated by Viereck 1914 : 7

= *Agrothereutes abbreviator* (Fabricius, 1793)

Agrypon, 1860 : 151.

Type species, *Ophion flaveolatum* Gravenhorst, 1807

Included by Foerster 1860 : 152 (Many species)

Designated by Morley 1913 : 424

= *Agrypon flaveolatum* (Gravenhorst, 1807)

Alcima : 152.

Type species, *Campoplex orbitalis* Gravenhorst, 1829

Included by Brischke 1880 : 147 (Monobasic)

= *Casinaria* Holmgren, 1858 (Szépligeti 1911)

= *Casinaria orbitalis* (Gravenhorst, 1829)

Alcocerus : 161.

Type species, *Tryphon?* *trifasciatus* Cresson, 1864

Included by Davis 1897 : 207 (Monobasic)

= *Colpotrochia* Holmgren, 1856 (Townes 1945)

= *Colpotrochia trifasciata* (Cresson, 1864)

Alcochera : 205.

***Alegina* : 176.**

Type species, *Algina* [sic] *alaskensis* Ashmead, 1902

Included by Ashmead 1902 : 188 (Monobasic)

= *Alegina solitarius* (Ashmead, 1902) (Cushman 1922, Townes 1944)

***Alexeter* : 199.**

Type species, *Mesoleptus ruficornis* Gravenhorst, 1829

Included by Woldstedt 1877 : 459 (Three species)

Designated by Viereck 1914 : 7

= *Alexeter sectator* (Thunberg, 1822)

Townes 1945, regards this genus as a synonym of *Mesoleius* Holmgren.

***Allocamptus* : 150.**

Type species, *Ophion undulatus* Gravenhorst, 1829

Included by Thomson 1888 : 1189 (Monobasic)

= *Enicospilus* Stephens, 1820 (Morley 1913)

= *Enicospilus undulatus* (Gravenhorst, 1829)

***Allocota* : 173 nec Motschoulsky, [1860].**

Type species, *Allocota confederatae* Ashmead, 1896

Included by Ashmead 1896a : 208 (Monobasic)

= *Chirotica* Foerster, 1868 **syn. n.**

= *Chirotica confederatae* (Ashmead, 1896) **comb. n.**

***Allocritus* : 211.**

Type species, *Mesoleius tenuiventris* Holmgren, [1856] (By present designation)

= *Mesoleius* Holmgren, 1855 **syn. n.**

= *Mesoleius tenuiventris* Holmgren, [1856]

***Allomacrus* : 177.**

Type species, *Allomacrus pimplarius* Thomson, 1888

Included by Thomson 1888b : 1282 (Monobasic)

***Allophrys* : 147.**

Type species, *Thersilochus* [sic] *oculatus* Ashmead, 1895

Included by Szépligeti 1905 : 56 (Three species)

Designated by Viereck 1914 : 8

= *Allophrys oculatus* (Ashmead, 1895)

***Alloplasta* : 167.**

Type species, *Lissonota murina* Gravenhorst, 1829

Included by Woldstedt 1877 : 445 (Monobasic)

= *Alloplasta piceator* (Thunberg, 1822) (Roman 1912 as *Meniscus*) [c.f. *Amersibia* where this species has been incorrectly placed].

***Ameloctonus* : 157.**

Type species, *Banchus fugitivus* Say, 1836

Included by Ashmead in Smith 1900a : 582 (Two species)

Designated by Viereck 1914 : 9

= *Hyposoter* Foerster, 1868 (Gahan 1914)

= *Hyposoter fugitivus* (Say, 1836)

Amersibia : 167, n.n. for *Meniscus* Schiødte.

Type species, *Ichneumon catenator* Panzer, 1804

This antedates *Meniscus* (*Amersibia*) *variipes* Szépligeti included by Szépligeti 1900 : 18, 36 (Monobasic)

Amersibia, being a new name, takes the same type species as *Meniscus*.

Amesolytus : 161.

Type species, *Amesolytus ferrugineus* Ashmead, 1896

Included by Ashmead 1896a : 201 (Monobasic)

= *Exochus* Gravenhorst, 1829 (Uchida 1930)

= *Exochus ferrugineus* (Ashmead, 1896)

Amorphognathon : 203.

Type species, *Tryphon melanocerus* Gravenhorst, 1829

Included by Kriechbaumer 1897a : 185 (Monobasic)

= *Trematopygus* Holmgren, 1855 (Roman 1925)

= *Trematopygus melanocerus* (Gravenhorst, 1829)

Amorphota : 151.

Type species, *Amorphota orgyiae* Howard, 1897

Included by Howard 1897 : 20, fig. 7, and 53 (Monobasic)

= *Casinaria* Holmgren, 1858 (Gahan 1914)

= *Casinaria limenitidis* (Howard, 1889) (Townes 1945)

Anecphysis : 195.

Type species, *Anecphysis curvineura* Davis, 1897

Included by Davis 1897 : 234 (Monobasic)

= *Exyston* Schiødte, 1839 (Townes 1944)

= *Exyston nigreo* Davis, 1897 (Townes 1944)

Anempheres : 154.

Type species, *Anempheres diaphaniae* Viereck, 1911

Included by Viereck, 17 April 1911a : 188 (Monobasic)

= *Casinaria* Holmgren, 1858 (Gahan 1914)

= *Casinaria infesta* (Cresson, 1872) (Gahan 1914)

Anephares [sic] *rufipes* Hancock 1911, *Nature Sketches in Temperate America* : 177 has not been seen, and the exact date of publication has not been discovered. Thus the Viereck reference has been taken as the prior publication.

Aneuclis : 147.

Type species, *Isurgus rufipes* Szépligeti, 1899

Included by Szépligeti October (at latest) 1905 : 55 (Five species and two synonyms)

Designated by Viereck 1914 : 11

= *Aneuclis maritimus* (Thomson, 1889) (Szépligeti 1905)

Aniarophron : 162.

Type species, *Aniarophron niger* Szépligeti, 1901 (By present designation)

Included by Szépligeti in Zichy 1901 : 141 (Three species)

Anilastus : 157.

Type species, *Campoplex rapax* Gravenhorst, 1829

Anilasta [emend. pro -tus], included by Thomson 1887 : 1169 (Many species)

Designated by Viereck 1910 : 383

= *Hyposoter* Foerster, 1868 (Gahan 1914)

= *Hyposoter rapax* (Gravenhorst, 1829)

Aniseres 1871 : 92.

Type species, *Aniseres pallipes* Foerster, 1871

Included by Foerster 1871 : 93 (Two species)

Designated by Viereck 1914 : 11

= *Proclitus* Foerster, 1868

= *Proclitus spectabilis* Foerster, 1871 (cf. Thomson 1888b : 1304)

Anisoctenion : 194.

Type species, *Acrotomus xanthopus* Holmgren, 1855

Included by Schmiedeknecht 1907a : 618 (Monobasic)

= *Anisoctenion alacer* (Gravenhorst, 1829) (Pfankuch 1906)

Anopiesta : 193.

Type species, *Herpestomus ardeicollis* Wesmael, 1844 (By present designation)

= *Eriplatys* Foerster, 1868 **syn. n.**

= *Eriplatys ardeicollis* (Wesmael, 1844)

Apechthis : 164.

Type species, *Pimpla rufata* (Gmelin) ; Gravenhorst, 1829

Included by Woldstedt 1877 : 442 (Two species)

As *Pimpla rubata* [lapsus pro *rufata*] Gravenhorst, designated by Ashmead 1900b : 57

= *Apechthis rufata* (Gmelin, 1790)

Aperileptus : 170.

Type species, *Plectiscus albipalpus* Gravenhorst, 1829

Included and designated by Foerster 1871 : 76 (Many species)

= *Aperileptus albipalpus* (Gravenhorst, 1829)

Aphanistes : 145.

Type species, *Anomalon bellicosum* Wesmael, 1849

Included by Brischke 1880 : 135 (Three species and one synonym)

Designated by Viereck 1914 : 13

= *Aphanistes bellicosus* (Wesmael, 1849)

Aphanodon : 166.

Type species, *Phytodietus errabundus* Gravenhorst, 1829

Included by Schmiedeknecht 1888 : 436 (Monobasic)

= *Cryptopimpla* Taschenburg, 1863

= *Cryptopimpla errabunda* (Gravenhorst, 1829)

Aphanoroptrum : 168.

Type species, *Lissonota ruficornis* Gravenhorst, 1829

Included by Thomson 1877 : 736

= *Aphanoroptrum abdominale* (Gravenhorst, 1829)

Thomson quotes the species as "*Aphanoroptra* [emend. pro -um] *ruficornis* (*Pimpla* Grav.)." This was a lapsus for *Lissonota ruficornis*, a well-known synonym of *Aphanoroptrum abdominale* (Gravenhorst). There is no true basis for the selection by Viereck of *Pimpla ruficollis* Gravenhorst as the emendation of *ruficornis* given by Thomson.

***Apimeles* : 205.**

Type species, *Apimeles lusorius* Davis, 1898

Included by Davis 1898 : 283 (Monobasic)

= *Grypocentrus* Ruthe, 1855 (Townes 1944)

= *Grypocentrus flavipes* (Provancher, 1882) (Townes 1944)

***Apoclima* : 171.**

Type species, *Apoclima signaticorne* Foerster, 1871

Included and designated by Foerster 1871 : 98 (Monobasic)

***Apsilops* : 182.**

Type species, *Cryptus hirtifrons* Ashmead, 1890

Included by Ashmead 1896a : 207 (Monobasic)

= *Apsilops hirtifrons* (Ashmead, 1890)

***Apterophygus* : 172.**

Type species, *Apterophygus*? *paradoxus* Bridgman, 1889

Included as *Hemiteles* (*Apterophygus*) *paradoxus* (Bridgman) by Schmiedeknecht 1897 : 133 (Monobasic)

= *Phygadeuon* Gravenhorst, 1829 **syn. n.**

= *Phygadeuon paradoxus* (Bridgman, 1889) **comb. n.**

***Aptesis* 1850 : 82.**

Type species, *Ichneumon sudeticus* Gravenhorst, 1815

Included by Foerster 1850 : 86 (Many species)

Designated by Viereck 1914 : 14

= *Aptesis nigrocincta* (Gravenhorst, 1815)

***Apystus* : 212.**

Type species, *Tryphon albopictus* Gravenhorst, 1829 (By present designation)

= *Hypamblys* Foerster, 1868 **syn. n.**

= *Hypamblys albopictus* (Gravenhorst, 1829)

***Aritranis* : 187.**

Type species, *Cryptus explorator* Tschek, 1870

Included by Tschek 1870 : 156 (Two species)

Designated by Viereck 1914 : 15

Syn. *Hoplocryptus* Thomson, 1873 **syn. n.**

= *Aritranis explorator* (Tschek, 1870)

Tschek 1870 : 140 includes *Cryptus coxator* Tschek and *Cryptus fuscicornis* Tschek under *Aritranis*. This is a misprint which is corrected on page 156. This correction has been accepted and the above type designation is considered valid.

Cryptus carnifex Gravenhorst was invalidly designated as type species by Schmiedeknecht 1890 : 121, as this was not one of the two originally included species.

***Aschistus* : 177.**

Type species, *Hemimachus variabilis* Ratzeburg, 1852

Included by Brischke 1891 : 71 (Two species and one synonym)

Designated by Viereck 1914 : 15

=*Gelis* Thunberg, 1827

=*Gelis cursitans* (Fabricius, 1775)

***Aselasma* : 209.**

***Asinamora* : 155.**

***Asphragis* : 166.**

Type species, *Lissonota occupator* Gravenhorst, 1829

Included by Schmiedeknecht 1888 : 434 (Four species)

Designated by Viereck 1914 : 15

=*Cylloceria* Schiødte, 1838 **syn. n.** (syn. *Lampronota* auctt.)

=*Cylloceria occupator* (Gravenhorst, 1829) **comb. n.**

The type of *Lissonota occupator* was labelled by Pfankuch as *Lampronota langei* Brauns, 1905. When I saw the specimen in 1936, I agreed with this determination.

***Asthenara* : 203.**

Type species, *Asthenarus* (emend. pro -ra] *crassifemur* Thomson, 1889

Included by Thomson 1889a : 1437 (Monobasic)

=*Asthenara socius* (Holmgren, 1855) (Roman 1910)

***Asthenomeris* : 168.**

Type species, *Asthenomeris nigricoxis* Schmiedeknecht, 1888

Included by Schmiedeknecht 1888 : 426 (Monobasic)

***Asthenoptera* : 175.**

Standing under this name in the Foerster Collection is a *Gelis* male with a deep genal sulcus ; males of this species group are as yet unable to be identified.

Roman 1925 : 17 suggests that this genus was probably erected for *Hemiteles stagnalis* Thomson, 1884 and *lissonotoides* Thomson, 1885.

***Astiphromma* : 170.**

Type species, *Mesochorus scutellatus* Gravenhorst, 1829

Included by Brischke 1880 : 179, 180, 191, 192 (Six species)

Designated by Morley 1913 : 516

=*Astiphromma scutellatum* (Gravenhorst, 1829)

***Astomaspis* : 175.**

Type species, *Astomaspis metathoracica* Ashmead, 1904

Included by Ashmead 1904 : 140 (Monobasic)

Astrenis : 148.

Type species, *Hambergiella sinuata* Roman, 1909 (By present designation).

Syn. *Hambergiella* Roman, 1909 **syn. n.**

= *Astrenis sinuata* (Roman, 1909) **comb. n.**

Both *H. sinuata* and *Mengersenia paradoxa* Schmiedeknecht, 1907 were present in the Foerster Collection under this name. Both agree in fair measure with Foerster's key, but perhaps *H. sinuata* agrees a little better and hence is selected as type species.

Authors have regarded *Mengersenia*, Schmiedeknecht, 1907 as being synonymous with *Hambergiella* Roman, 1909, but present evidence seems to me to warrant the retention of these two genera as distinct.

Asymmictus : 200.

Type species, *Asymmictus iridescens* Davis, 1898

Included by Davis 1898 : 325 (Two species)

Designated by Viereck 1914 : 16

Asyncrita 1876 : 29.

Type species, *Atractodes foveolatus* Gravenhorst, 1829

Included and designated by Foerster 1876 : 30 (Many species)

= *Asyncrita foveolata* (Gravenhorst, 1829)

Some authors synonymize this genus with *Atractodes* Gravenhorst, 1829.

Ateleute : 171.

Type species, *Ateleute linearis* Foerster, 1871

Included and designated by Foerster 1871 : 99 (Monobasic)

Atithasus : 210.

Type species, *Atithasus stellarius* Davis, 1898

Included by Davis 1898 : 291 (Monobasic)

= *Labrossyta* Foerster, 1868 (Townes 1945)

= *Labrossyta bimaculata* (Ashmead, 1896) (Townes 1945)

Atmetus : 160.

Type species, *Atmetus tetrazonatus* Ashmead, 1896

Included by Ashmead 1896a : 204 (Three species)

Designated by Viereck 1914 : 17

= *Orthocentrus* Gravenhorst, 1829 (Townes 1945)

= *Orthocentrus tetrazonatus* (Ashmead, 1896)

Atrestes : 209.

Type species, *Catoglyptus* (*Stiphrosomus*) *sulcatus* Thomson, 1895 (By present designation)

= *Trapezocora* Foerster, 1868 **syn. n.**

= *Trapezocora sulcata* (Thomson, 1895) **comb. n.**

Atrometus : 146.

Type species, *Atrometus insignis* Foerster, 1878

Included by Foerster 1878 : 77 (Two species)

Designated by Viereck 1914 : 17

Azelus : 205.

Type species, *Tryphon erythrophalpus* (Gmelin) ; Gravenhorst, 1829 (By present designation)

= *Azelus erythrophalpus* (Gmelin, 1790) **comb. n.**

syn. *Epachthes* Foerster, 1868 nec Nordman, 1832 **syn. n.**

Bachia : 186 nec Gray, 1845.

Type species, *Phygadeuon* (*Bachia*) *testaceipes* Brischke, 1891

Included by Brischke 1891 : 69 (Monobasic)

= *Endasys* Foerster, 1868 (syn. *Bachiana* Strand, 1928 (n.n.)) (Viereck 1914)

= *Endasys testaceipes* (Brischke, 1891)

Baeosemus : 194.

Type species, *Ichneumon mitigosus* Gravenhorst, 1829

Included by Holmgren 1889 : 424 (Two species)

Designated by Ashmead 1900b : 23

= *Baeosemus mitigosus* (Gravenhorst, 1829)

Barycnemis : 147.

Type species, *Porizon claviventris* Gravenhorst, 1829

Included by Brischke 1880 : 192 (Monobasic)

= *Barycnemis claviventris* (Gravenhorst, 1829)

Barydotira : 178.

Type species, *Barydotira hammari* Viereck, 1912

Included by Viereck 1912d : 584 (Monobasic)

= *Alegina* Foerster, 1868 (Townes 1944)

= *Alegina hammari* (Viereck, 1912)

Barylypa : 146.

Type species, *Anomalon* (*Barylypa*) *genalis* Thomson, 1892

Included by Thomson 1892 : 1767 (Two species)

Designated by Viereck 1914 : 19

= *Barylypa delictor* (Thunberg, 1822) (Habermehl 1920)

Anomalon perspicillator Gravenhorst, designated by Morley 1913 is invalid as this species was not originally included.

Baryntica : 184.

Type species, *Stylocryptus elegans* Schmiedeknecht, 1932 (By present designation)

= *Baryntica elegans* (Schmiedeknecht, 1932) **comb. n.**

This I regard for the present as representing a distinct genus.

Barytarbes : 212.

Type species, *Tryphon colon* Gravenhorst, 1829

As *Mesoleius* (*Barytarbus* [emend. pro -es]) *colon* (Gravenhorst), included by Thomson 1883 : 931 (Five species)

Designated by Viereck 1914 : 20

= *Barytarbes colon* (Gravenhorst, 1829)

Bathycetes : 167.

Type species, *Ichneumon catenator* Panzer, 1804

Included and designated by Schmiedeknecht, 1888 : 439 (Monobasic)

= *Lampronota* Curtis, 1832

= *Lampronota catenator* (Panzer, 1804)

Bathymetis : 182.

Type species, *Phygadeuon (Bathymetis) cylindricus* Brischke, 1891

Included by Brischke 1891 : 70 (Two species)

Designated by Viereck 1914 : 20

= *Phygadeuon* Gravenhorst, 1829

= *Phygadeuon cylindricus* (Brischke, 1891)

Bathyplectes : 156.

Type species, *Campoplex exiguus* Gravenhorst, 1829

Included as a synonym of *Canidia* Holmgren by Szépligeti 1911 : 12, 13
(Many species)

As *Canidia exigua*, designated by Viereck 1914 : 20

= *Bathyplectes exiguus* (Gravenhorst, 1829)

Bathythrix : 176.

Type species, *Bathythrix meteori* Howard, 1897

Included by Howard 1897 : 53 (Two species)

Designated by Viereck 1914 : 20

Bioblapsis : 162.

Type species, *Bassus flavipes* Holmgren, [1856] nec Lucas, 1846

Included by Dalla Torre 1901 : 242 (Monobasic)

= *Bioblapsis polita* (Snellen, 1878) **comb. n.**

Blapsidotes : 177.

Type species, *Hemiteles melanarius* Gravenhorst, 1829 (By present designation)

= *Blapsidotes melanarius* (Gravenhorst, 1829) **comb. n.**

This species, at present included in *Hemiteles*, I regard as belonging to a separate segregate.

Blapticus : 171.

Type species, *Blapticus leucostomus* Foerster, 1871

Included and designated by Foerster 1871 : 83 (Monobasic)

Boethus : 210.

Type species, *Boethus howardi* Davis, 1898

Included by Davis 1898 : 290 (Three species)

Designated by Viereck 1914 : 22

= *Boethus schizoceri* (Howard, 1888) (Viereck 1914)

Bothynophrys : 166.

Type species, *Ichneumon catenator* Panzer, 1804

Included by Woldstedt 1877 : 444 (Monobasic)

Synonymized by Schmiedeknecht 1888 : 439 with *Bathycetes*

=*Lampronota* Curtis, 1832

=*Lampronota catenator* (Panzer, 1804)

***Brachycephalus* : 179** nec Fitzinger, 1826.

Type species, *Hemiteles aestivalis* Gravenhorst, 1829

Included by Roman 1925 : 14 (Four species)

Designated by Townes 1944 : 180

=*Dichrogaster* Doumerc, 1855 **syn. n.** (syn. *Brachycranium* Ashmead, 1900 (n.n.))

=*Dichrogaster aestivalis* (Gravenhorst, 1829) **comb. n.**

***Brephoctonus* : 159.**

Type species, *Plectiscus impurator* Gravenhorst, 1829

Included and designated by Foerster 1871 : 79 (Monobasic)

=*Plectiscus* Gravenhorst, 1829 (Townes 1958) (syn. *Leipaulus* Townes, 1945)

***Cacotropa* : 208.**

Type species, *Cacotropa sericea* Thomson, 1888

Included by Thomson 1888a : 1259 (Monobasic)

=*Sphecophaga* Westwood, 1840

=*Sphecophaga vesparum* (Curtis, 1828)

***Caenomeris* : 174.**

Type species, *Xestophya nigripes* Ashmead, 1902

Included and designated by Townes 1944 : 227

=*Cremnodes* Foerster, 1850 **syn. n.**

=*Cremnodes nigripes* (Ashmead, 1902) **comb. n.** (cf. also *Stygera*)

***Calliclisis* : 169.**

Type species, *Ephialtes hecticus* Gravenhorst, 1829

Included by Schmiedeknecht 1888 : 440-1 (Three species)

Designated by Viereck 1914 : 25

=*Calliclisis hectica* (Gravenhorst, 1829)

***Callidiotes* : 199.**

Type species, *Mesoleptus coxator* Gravenhorst, 1829

Included by Foerster 1876 : 19 (Monobasic)

=*Oxytorus* Foerster, 1868 (Meyer 1936 : 147)

=*Oxytorus luridator* (Gravenhorst, 1829) (Pfankuch 1906)

***Callidora* : 157.**

Type species, *Callidora annellata* Thomson, 1887

Included by Thomson 1887 : 1136 (Two species)

Designated by Viereck 1912c : 633

***Calliphururus* : 210.**

Type species, *Calliphururus granulosus* Davis, 1898

Included by Davis 1898 : 290 (Monobasic)

=*Alegina* Foerster, 1868 (Townes 1944)

=*Alegina granulosa* (Davis, 1898)

Camarotops : 160.

Type species, *Neuratelus* [sic] *ulmicola* Ashmead, 1896

As *Camerotops* [lapsus pro *Camar-*], included by Davis 1897 : 226 (Four species)

Designated by Viereck 1914 : 28

= *Stenomacrus* Foerster, 1868 (Townes 1945)

= *Stenomacrus ulmicola* (Ashmead, 1896)

Campodorus : 213.

Type species, *Mesoleius melanogaster* Holmgren, [1855] (By present designation)

= *Mesoleius* Holmgren, [1855] **syn. n.**

= *Mesoleius melanogaster* Holmgren, [1855]

Campogenes : 209.

Type species, *Tryphon antilope* Gravenhorst, 1829 (By present designation)

= *Trapezocora* Foerster, 1868 **syn. n.**

= *Trapezocora antilope* (Gravenhorst, 1829) **comb. n.**

Campoletis : 157.

Type species, *Mesoleptus tibiator* Cresson, 1864

Included by Houghton 1907 : 89 (Monobasic)

syn. *Sagaritis* Holmgren, 1858, *Sagaritopsis* Hincks, 1944

= *Campoletis tibiator* (Cresson, 1864)

Camponastes : 212.

Type species, *Camponastes basilius* Davis, 1898

Included by Davis 1898 : 292 (Monobasic)

= *Polyterus* Foerster, 1868 (Townes 1945)

= *Polyterus basilius* (Davis, 1898)

Campoporus : 210.

Type species, *Ichneumon dictator* Thunberg, 1822 (By present designation)

= *Trematopygus* Holmgren, [1855] **syn. n.**

= *Trematopygus dictator* (Thunberg, 1822)

Camporychus : 208.**Camposcopus** : 145.

Type species, *Camposcopus acclerivora* Rohwer, 1915

Included by Rohwer 1915 : 226 (Monobasic)

= *Erigorgus* Foerster, 1868 (Townes 1945)

= *Erigorgus acclerivora* (Rohwer, 1915)

Campothreptus : 201.

Type species, *Mesoleptus nasutus* Cresson, 1868

Included by Davis 1897 : 247 (Monobasic)

= *Campothreptus nasutus* (Cresson, 1868)

Campotrephus : 152.

Type species, *Campoplex tenuiventris* Gravenhorst, 1829

Quoted as a synonym of *Casinaria* Holmgren by Szépligeti 1911 : 13, 15 (Many species)

Designated by Viereck 1914 : 27

=*Casinaria* Holmgren, [1858]

=*Casinaria tenuiventris* (Gravenhorst, 1829)

Catalytus 1851 : 62.

Type species, *Pezomachus fulveolatus* Gravenhorst, 1829

Included by Foerster 1851 : 63 (Three species)

Designated by Viereck 1914 : 28

=*Catalytus fulveolatus* (Gravenhorst, 1829)

Catastenus : 170.

Type species, *Catastenus femoralis* Foerster, 1871

Included and designated by Foerster 1871 : 75 (Monobasic)

Szépligeti 1911 : 55 regarded this as synonym of *Symplecis* Foerster, 1868.

Chaeretymma : 187.

Type species, *Cryptus anatorius* Gravenhorst, 1829

Included and designated by Schmiedeknecht 1890 : 117 (Monobasic)

=*Chaeretymma anatorius* (Gravenhorst, 1829)

The designation by Cushman 1920 : 259 of *Cryptus ater* Brischke is invalid as Brischke 1880 : 338 states that he was unable to bring the four species (including *ater*) to the right genus either in Thomson or Foerster, but possibly the species belonged to *Chaeretymma* Foerster.

The designation of *Cryptus furcator* Gravenhorst by Viereck 1914 : 30 is antedated.

Townes 1944 synonymized this segregate with *Cubocephalus* Ratzeburg, 1848, but this synonymy is very doubtful.

Chamaezelus : 181.

Type species, *Stibeutes heinemanni* Foerster, 1850 (By present designation)

=*Stibeutes* Foerster, 1850 **syn. n.** (q.v.)

Chamerpes : 172.

Type species, *Pezomachus hemipterus* (Fabricius) ; Gravenhorst, 1829

Included by Ashmead 1900b : 209 and 27 (Monobasic)

=*Theroscopus* Foerster, 1850

=*Theroscopus hemipterus* (Fabricius, 1793) **comb. n.**

Chamerpes is quoted as a synonym of *Phyrtus* by Ashmead 1900 Index. Viereck has accepted this as the designation of the type species of both genera.

Townes 1944 has synonymized this genus with *Eriplanus* Foerster, 1868.

Charitopes : 181.

Type species, *Hemiteles (Charitopes) chrysopae* Brischke, 1890

Included by Brischke 1890 : 105 (Monobasic)

=*Charitopes chrysopae* (Brischke, 1890)

Chirotica : 173.

Type species, *Hemiteles insignis* Gravenhorst, 1829

As *Hemiteles (Chirotica) insignis* included by Schmiedeknecht 1897 : 502 (Monobasic)

=*Chirotica trifasciator* (Thunberg, 1822) (Roman 1912) **comb. n.**

The name *Chirotica* has been used in preference to *Diaglypta* because of page priority. Both names have had a similar amount of use.

***Chorischizus* : 168.**

Type species, *Acoenites nigripennis* Gravenhorst, 1829

Included by Schmiedeknecht 1888 : 426 (Monobasic)

= *Phaenolobus* Foerster, 1868 (Roman 1910)

= *Phaenolobus nigripennis* (Gravenhorst, 1829)

***Chriodes* : 178.**

Type species, *Chriodes* [sic] *oculatus* Ashmead, 1905 (Monobasic)

Included by Ashmead 1905 : 966

= *Chriodes oculatus* Ashmead, 1905

***Cidaphurus* : 159.**

Type species, *Ichneumon volutatorius* Linnaeus, 1758

Included by Woldstedt 1877 : 439 (Monobasic)

= *Banchus* Fabricius, 1798 (Szépligeti 1911)

= *Banchus volutatorius* (Linnaeus, 1758)

***Cidaphus* : 149.**

Type species, *Cidaphus thuringiacus* Brauns, 1890

Included by Brauns 1890 : 78 (Two species)

Designated by Viereck 1914 : 33

= *Cidaphus alarius* (Gravenhorst, 1829) (sec Szépligeti 1911 and Roman 1939)

***Clepsiorthus* : 200.**

Type species, *Mesoleptus* ? *rubiginosus* Cresson, 1878

Included by Davis 1898 : 326 (Four species)

Designated by Viereck 1914 : 33

= *Himerta* Foerster, 1868 (Cushman 1927)

= *Himerta rubiginosa* (Cresson, 1878)

***Cnemischys* : 201.**

Type species, *Adelognathus* (*Cnemischus* [emend. pro -ys]) *pilosus* Thomson, 1888

Included by Thomson 1888b : 1277 (Two species)

Designated by Townes 1944 : 144

= *Cnemischys pilosus* (Thomson, 1888)

***Coeloconus* : 203.**

Type species, *Ichneumon brachyacanthus* Gmelin, 1790

Included by Morley 1911 : 178 (Monobasic)

Viereck 1914 gives the date as 1912 in error. The copy in the British Museum has the receipt date 23.12.1911.

= *Coeloconus brachyacanthus* (Gmelin, 1790)

Townes & Townes 1950 consider this genus as a synonym of *Monoblastus* Hartig, 1837.

Colocnema : 184.

Type species, *Cryptus rufinus* Gravenhorst, 1829

Included by Thomson 1874 : 590 (Monobasic)

syn. *Coelocryptus* Thomson, 1873 **syn. n.**

= *Colocnema rufina* (Gravenhorst, 1829)

(syn. *erythrostickus* Gravenhorst, 1829 (Thomson 1874))

Conoblata : 165.

Type species, *Glypta ceratites* Gravenhorst, 1829

Included by Woldstedt 1877 : 444 (Two species)

Designated by Viereck 1914 : 35

= *Glypta* Gravenhorst, 1829

= *Glypta ceratites* Gravenhorst, 1829

Cosmoconus : 203.

Type species, *Ichneumon elongator* Fabricius, 1775

Included by Woldstedt 1877 : 459 (Monobasic)

= *Cosmoconus elongator* (Fabricius, 1775)

Cremnodes 1850 : 72.

Type species, *Ichneumon atricapillus* Gravenhorst, 1815

Included and designated by Foerster 1850 : 73 (Three species)

syn. *Cremnias* Roman, 1939 (unnecessary new name)

= *Cremnodes atricapillus* (Gravenhorst, 1815)

Ctenacme : 196.

Type species, *Polyblastus* (*Ctenacmus* [emend. pro -e]) *scutellaris* Thomson, 1883

Included by Thomson 1883 : 901

Designated by Morley 1913 : 335 as *scutellatus* Thomson, 1888, n.n. for *Polyblastus scutellaris* Thomson, 1883 nec *P. scutellaris* Holmgren, [1855]

If the above designation is considered invalid, then the type species is *Polyblastus* (*Ctenacmus* [emend. pro -e]) *genalis* Thomson, 1883 designated by Viereck 1914 : 39

= *Ctenochira* Foerster, 1855 (Townes & Townes 1949) (the above alternative type species does not affect this synonymy)

= *Ctenochira scutellatus* (Thomson, 1888)

Ctenochares : 191.

Type species, *Ichneumon xanthomelas* Brullé, 1846

Included and designated by Schmiedeknecht 1903 : 256 (Two species)

= *Ctenochares instructor* (Fabricius, 1793)

Schmiedeknecht states that Foerster in his unpublished manuscript cited *Ichneumon xanthomelas* Brullé as the type of this genus. I accept this as a designation of type.

Ctenochira 1855 : 226.

Type species, *Ctenochira bisinuata* Foerster, 1855

Included by Foerster 1855 : 226 (Monobasic)

Daetora : 175.

Type species, *Hemiteles solutus* Thomson, 1884 (By present designation)

= *Gnyptomorpha* Foerster, 1868 **syn. n.**

= *Gnyptomorpha solutus* (Thomson, 1884)

Daictes : 176.

Type species, *Phygadeuon (Daictes) fukaii* Viereck, 1911

Included by Viereck 1911a : 194 (Monobasic)

= *Mastrus* Foerster, 1868 (Townes 1957)

= *Mastrus fukaii* (Viereck, 1911)

Dapanus : 183.

Type species, *Ichneumon cinctorius* Fabricius, 1775

Included and designated by Ashmead 1900b : 29 (Monobasic)

= *Apsilops* Foerster, 1868 (Townes 1944)

= *Apsilops cinctorius* (Fabricius, 1775)

Daspletis : 205 nec Loew, 1858.**Deleter** : 160.

Type species, *Deleter obscurus* Davis, 1897

Included by Davis 1897 : 221 (Three species)

Designated by Viereck 1914 : 42

= *Stenomacrus* Foerster, 1868 (Townes 1945)

= *Stenomacrus americanus* (Ashmead, 1896) (Townes 1945)

Deloglyptus : 193.

Type species, *Deloglyptus punctiventris* Thomson, 1891

Included by Thomson 1891 : 1623 (Monobasic)

Delolytus : 189.

Type species, *Atractodes varicornis* Holmgren, [1858]

Included by Foerster 1876 : 19 (Monobasic)

= *Oxytorus* Foerster, 1868

= *Oxytorus luridator* (Gravenhorst, 1829)

Delomerista : 164.

Type species, *Pimpla mandibularis* Gravenhorst, 1829

Included and designated by Schmiedeknecht 1888a : 448 (Monobasic)

= *Delomerista mandibularis* (Gravenhorst, 1829)

Delotomus : 194, n.n. for *Acrotomus* Holmgren, [1855].

Type species, *Tryphon lucidulus* Gravenhorst, 1829

Foerster 1868 quotes *Acrotomus* Holmgren as a synonym of *Delotomus* ; Thomson 1883 quotes the genus as *Delotomus* Holmgren.

Demopheles : 186.

Type species, *Phygadeuon caliginosus* Gravenhorst, 1829

Included by Dalla Torre 1902 : 678 (Monobasic)

= *Demopheles caliginosus* (Gravenhorst, 1829)

Diaborus : 195.

Type species, *Cteniscus (Diaborus) sedulus* Woldstedt, 1877

Included by Woldstedt 1877 : 455 (Two species)

Designated by Viereck 1912a : 176

=*Cteniscus* Haliday, 1837 (Schmiedeknecht 1912)

=*Cteniscus sedulus* Woldstedt, 1877

Diacritus : 191.

Type species, *Mesostenus rufipes* Provancher, 1875 (later quoted as *Mesoleptus* [sic] *rufipes* to which genus Provancher transferred it.

Included by Dalla Torre 1902 : 770 (One species and two synonyms)

Designated by Viereck 1914 : 43

=*Diacritus muliebris* (Cresson, 1868) (Cushman 1918)

The designation by Townes 1944 : 808 is invalid as *Mesoleptus* ? *muliebris* Cresson was only doubtfully included in the genus and is not therefore available. Davis 1895 : 288 states that " it would belong to his (Foerster's) genus *Diacritus* ".

Diadegma : 153.

Type species, *Campoplex crassicornis* Gravenhorst, 1829

Included by Schmiedeknecht 1907a : 599 (Monobasic)

=*Meloboris* Holmgren, [1858]

=*Meloboris crassicornis* (Gravenhorst, 1829)

Diaglypta : 176.

Type species, *Diaglypta radiata* Ashmead, 1895

Included by Ashmead 1895 : 780 (Monobasic)

=*Chirotica* Foerster, 1868 **syn. n.**

=*Chirotica radiata* (Ashmead, 1895) **comb. n.**

Dialges : 206.

Type species, *Tryphon vepretorum* Gravenhorst, 1829

Included by Kriechbaumer, June 1897 : 169 (Monobasic)

=*Otlophorus* Foerster, 1868 **syn. n.**

=*Otlophorus vepretorum* (Gravenhorst, 1829)

The inclusion of a species by Davis, July–Sept. 1897 (quoted by Viereck 1914 : 44) is therefore antedated.

Dialipsis : 171.

Type species, *Dialipsis exilis* Foerster, 1871

Included by Foerster 1871 : 84 (Many species)

Designated by Viereck 1914 : 44

Diaparsis : 149.

Type species, *Porizon nutritor* (Fabricius) ; Gravenhorst, 1829

As *Thersilochus* [emend. pro *Ter-*] (*Diaparsus* [emend pro *-is*]) *nutritor* Gravenhorst, included by Thomson 1889 : 1373 (Many species)

As *Ophion nutritor* F., designated by Morley 1913 : 514

=*Diaparsis nutritor* (Fabricius, 1804)

***Diaschisaspis* : 192.**

Type species, *Diaschisaspis campoplegoides* Holmgren, 1889

Included by Holmgren 1889 : 354 (Monobasic)

***Diatora* : 180.**

Type species, *Diatora prodeniae* Ashmead, 1904

Included by Ashmead 1904 : 141 (Monobasic)

***Diblastomorpha* : 165.**

Type species, *Cryptus (Glypta) bicornis* Desvignes, 1856

Included by Woldstedt 1877 : 444 (Monobasic)

=*Glypta* Gravenhorst, 1829

=*Glypta bicornis* Boie, 1850

***Diceratops* : 167.**

Type species, *Pimpla bicornis* Gravenhorst, 1829

Included by Schmiedeknecht 1888 : 438 (Monobasic)

=*Syzeuctus* Foerster, 1868 (Morley 1908)

=*Syzeuctus bicornis* (Gravenhorst, 1829)

***Dicolus* : 171.**

Type species, *Dicolus insectator* Foerster, 1871

Included by Foerster 1871 : 97 (Four species)

Designated by Viereck 1914 : 45

***Diedrus* : 200.**

Type species, *Diedrus areolatus* Davis, 1898

Included by Davis 1898 : 324 (Two species)

Designated by Viereck 1914 : 45

=*Ctenopelma* Holmgren, [1855] (Townes 1945)

=*Ctenopelma areolatum* (Davis, 1898)

***Dimophora* : 155.**

Type species, ? *Dimophora robusta* Brischke, 1880

Included by Brischke 1894 : 55 (Monobasic)

Brischke 1880, included three species as belonging to ? *Dimophora* ; these are therefore unavailable as type species at that date.

***Dinotomus* : 188.**

Type species, *Ichneumon lapidator* Fabricius, [1787]

Included by Berthoumieu 1896 : 296 (Three species and four synonyms)

Designated by Ashmead 1900b : 14

=*Trogus* Panzer, 1806 (Viereck 1914)

=*Trogus lapidator* (Fabricius, [1787])

***Diectes* : 153, nec Ménétriés, 1849 nec Reichenbach, 1850.**

Type species, *Campoplex exareolatus* Ratzeburg, 1852

Included by Schmiedeknecht 1907a : 599 (Two species)

Designated by Viereck 1914 : 46

=*Nythobia* Foerster, 1868 **syn. n.** (syn. *Inareolata* Ellinger and Sachtleben, 1927-8) (n.n.)

=*Nythobia exareolata* (Ratzeburg, 1852) **comb. n.**

Dioratica : 153.

Dirophanes : 183.

Type species, *Phygadeuon* (*Dirophanes*) *plesius* Viereck, 1912

Included by Viereck 1912b : 148 (Monobasic)

=*Phaeogenes* Wesmael, 1844 (Townes 1944)

=*Phaeogenes hariolus* (Cresson, 1867) (Cushman 1922)

Cushman 1922, stated that this species should be placed in *Herpestomus* ; Townes does not place *Herpestomus*.

Dizemon : 199.

Type species, *Mesoleptus typhae* (Fourcroy) ; Gravenhorst, 1829

Included as *Dicemon* [lapsus pro *Diz*-] by Kriechbaumer 1891a : 136 (Monobasic)

=*Hadrodactylus* Foerster, 1868 (Kriechbaumer 1891)

=*Hadrodactylus typhae* (Fourcroy, 1785)

Dicemon prolixus Foerster MS. is quoted by Kriechbaumer, 1891, as an aberration of *H. [adrodactylus] typhae*.

Dolioctonus : 212.

Type species, *Ichneumon defectivus* Gravenhorst, 1820 (By present designation)

=*Himerta* Foerster, 1868 **syn. n.**

=*Himerta defectiva* (Gravenhorst, 1820)

Dolophron : 155.

Dysantes : 207.

Type species, *Ichneumon debitor* Thunberg, 1822 (By present designation)

=*Lagarotis* Foerster, 1868 **syn. n.**

=*Lagarotis debitor* (Thunberg, 1822)

Townes 1945 has synonymized *Lagarotis* with *Mesoleius* Holmgren, [1855].

Dyspetes : 201.

Type species, *Tryphon praerogator* (Linnaeus) ; Gravenhorst, 1829

As *Dyspetus* [emend. pro -es] included by Thomson 1883 : 899 (Monobasic)

=*Dyspetes fracticeps* Townes & Townes 1950

It is possible that under the rules, this species should be known as *Dyspetes praerogator* Thomson.

Ecclinops : 201.

Type species, *Tryphon orbitalis* Gravenhorst, 1829

Included by Thomson 1883 : 913 (Seven species and one synonym)

Designated by Viereck 1914 : 49

=*Lathrolestes* Foerster, 1868 (Townes 1945)

=*Lathrolestes orbitalis* (Gravenhorst, 1829)

Echthronomas : 151.

Type species, *Casinaria ochrostoma* Holmgren, [1858]

Included by Schmiedeknecht 1908 : 1593 (Monobasic)

= *Echthronomas tricinctus* (Gravenhorst, 1829) (Pfankuch 1923)

Ecpaglus : 185.

Type species, *Phygadeuon brevicornis* Gravenhorst, 1829

Included and designated by Ashmead 1900b : 30 (Monobasic)

= *Schenkia* Foerster, 1868 (Townes 1944)

= *Schenkia graminicola* (Gravenhorst, 1829) (Thomson 1883)

Ecphora : 154 nec Conrad, 1843.

Type species, *Campoplex viennensis* Gravenhorst, 1829

Included by Thomson 1887 : 1124 (Three species)

Designated by Viereck 1914 : 50

= *Ecphoropsis* Ashmead, 1900 (n.n.)

= *Ecphoropsis viennensis* (Gravenhorst, 1829)

Ecporthetor : 184.

Type species, *Cryptus fortipes* Gravenhorst, 1829

Included and designated by Ashmead 1900b : 30 (Monobasic)

= *Cubocephalus* Ratzeburg, 1848 (Same type species)

= *Cubocephalus distinctor* (Thunberg, 1822) (Roman 1912)

Eczetesis : 196.

Type species, *Perilissus paniscoides* Ashmead, 1896

Included by Davis 1897 : 253 (Monobasic)

= *Absyrtus* Holmgren, [1858] (Cushman 1922)

= *Absyrtus paniscoides* (Ashmead, 1896)

Encrates : 180 nec Gistel, 1848.

Type species, *Hemiteles* (*Encratis* [sic] ?) *subimpressus* Brischke, 1892

Included by Dalle Torre 1902 : 670 (Monobasic)

= *Encrateola* Strand, 1916 (n.n.)

= *Encrateola laevigatus* (Ratzeburg, 1848) **syn. n.**

This probably represents a distinct genus of the *Hemiteles* complex.

Endasys : 184.

Type species, *Stylocryptus analis* Thomson, 1883

Included by Roman 1909 : 243 (Two species)

Designated by Viereck 1914 : 51

= *Endasys analis* (Thomson, 1883)

Enizemum : 162.

Type species, *Bassus tibialis* Cresson, 1868

Included by Davis 1895a : 27 (Monobasic)

= *Enizemum petiolatum* (Say, 1836) (Townes 1940)

***Enoecetis* : 211.**

Type species, *Enoecetis scutellaris* Kriechbaumer, 1897

Included by Kriechbaumer 1897 : 175 (Monobasic)

***Ensimus* : 167 nec Thomson, 1859.**

Type species, *Lissonota dubia* Holmgren, [1854]

Included by Schmiedeknecht 1888 : 438 (Four species)

Designated by Viereck 1914 : 51.

= *Pimplopterus* Ashmead, 1900 (Townes 1944)

= *Pimplopterus dubius* (Holmgren, [1854])

***Entelechia* 1871 : 110.**

Type species, *Entelechia suspiciosa* Foerster, 1871

Included by Foerster 1871 : 111 (Monobasic)

***Entypoma* : 171.**

Type species, *Entypoma robustum* Foerster, 1871

Included and designated by Foerster 1871 : 82 (Monobasic)

***Epachthes* : 205 nec Nordman, 1832.**

Type species, *Tryphon erythrophalpus* (Gmelin) ; Gravenhorst, 1829

As *Epachtus* [emend. pro -es], included by Thomson 1894 : 1999 (Two species)

Designated by Viereck 1914 : 51

= *Azelus* Foerster, 1868, **syn. n.**

= *Azelus erythrophalpus* (Gmelin, 1790) **comb. n.**

I regard *Anisotacrus* Schmiedeknecht, 1913 as having been described as a new genus, not as a new name for *Epachtus* (lapsus pro -es) in Thomson, having regard to the discussion which Schmiedeknecht gives, which is based on the non-agreement of included species with Foerster's diagnosis.

***Eparces* : 193.**

Type species, *Centeterus (Eparces) grandiceps* Thomson, 1891

Included by Thomson 1891 : 1638 (Monobasic)

= *Eparces grandiceps* (Thomson, 1891)

Epiphobus* : 185.**Epistathmus* : 149.**

Szépligeti 1905a : 531 gives ? *Epistathrum* [sic] ? *jucunda* Holmgren (i.e. ? *Thersilochus jucundus* Holmgren, [1858])

***Epitomus* : 192.**

Type species, *Epitomus parvus* Thomson, 1891

Included by Thomson 1891 : 1626 (Monobasic)

***Epiurus* : 164 nec Rafinesque, 1815.**

Type species, *Pimpla brevicornis* Gravenhorst, 1829

Included by Woldstedt 1877 : 443 (Five species)

Designated by Ashmead 1900b : 58

= *Scambus* Hartig, 1838

= *Scambus brevicornis* (Gravenhorst, 1829)

Eremochila : 165.

Type species, *Pimpla ruficollis* Gravenhorst, 1829

Included and designated by Schmiedeknecht 1888a : 449 (Monobasic)

= *Eremochila ruficollis* (Gravenhorst, 1829)

Eremotylus : 150.

Type species, *Ophion marginatum* (Jurine) ; Gravenhorst, 1829

Included by Thomson 1888 : 1193 (Monobasic)

= *Eremotylus marginatus* (Jurine, 1807)

Eriborus : 153.

Type species, *Anilasta perfida* (Gravenhorst) ; Thomson, 1887

Included by Schmiedeknecht 1907a : 599 (Two species)

As *Erioborus* [lapsus pro *Eribo-*], designated by Morley 1913 : 469

= *Hyposoter* Foerster, 1868 **syn. n.**

= *Hyposoter perfidus* (Gravenhorst, 1829) **comb. n.**

Eridolius : 195.

Type species, *Exenterus pygmaeus* Holmgren, [1855]

Included by Thomson 1883 : 889 (Monobasic)

= *Cteniscus* Haliday, 1837 (Mason in Muesebeck, Krombein & Townes 1951)

= *Cteniscus pygmaeus* (Holmgren, [1855])

Erigloea : 202.

Type species, *Erigloea polita* Kriechbaumer, 1891

Included by Kriechbaumer 1891b : 299 (Three species)

Designated by Viereck 1914 : 53

= *Xenoschesis* Foerster, 1868 (Cushman 1915)

= *Polycinetis* Foerster (subgenus of *Xenoschesis*) (Townes 1945)

= *Xenoschesis* (*Polycinetis*) *resplendens* (Holmgren, [1855])

Erigorgus : 146.

Type species, *Anomalon fibulator* Gravenhorst, 1829 (By present designation)

Included by Brischke 1880 : 136 (Three species)

= *Erigorgus fibulator* (Gravenhorst, 1829)

Viereck 1914, made an invalid selection of type for this genus. Brischke assigned three species definitely to *Erigorgus*, namely *Anomalon fibulator* Gravenhorst, *A. perspicillator* Gravenhorst and *A. rufum* Holmgren. In addition, he described *Anomalon* (? *Erigorgus*) *carinatum* as new and it is this species which Viereck erroneously selected as the type species of the genus, for species doubtfully referred to a genus are not available for selection as the type species. I therefore now select as type species *Anomalon fibulator* Gravenhorst. This retains the traditional usage of *Erigorgus* of European authors so far as is at present known. Townes has synonymized *Erigorgus* with *Gravenhorstia*. *Anomalon perspicillator* Gravenhorst, *A. rufum* Holmgren and *A.* (? *E.*) *carinatum* have been placed in *Barylypa* by European workers.

Eriplanus : 180.

Type species, *Hemiteles (Eriplanus) metacomet* Viereck, 1917

Included by Viereck, 1917 : 340 (Monobasic)

= *Eriplanus micator* (Gravenhorst, 1807) (Townes 1944)

Eriplatys : 193.

Type species, *Herpestomus ardeicollis* Wesmael, 1844

Included by Thomson 1891 : 1616 (Monobasic)

= *Eriplatys ardeicollis* (Wesmael, 1844)

Eripternus : 152.

Type species, *Eripternus tarsalis* Szépligeti, 1911

Included by Szépligeti 1911 : 10 (Two species)

Designated by Viereck 1914 : 54

Ashmead in Smith 1900a : 581 quotes *E. primus* Ashmead ; this however is a nomen nudum.

Ernoctona : 183.

Type species, *Phygadeuon rugulosus* Gravenhorst, 1829 (By present designation)

= *Phygadeuon* Gravenhorst, 1829 **syn. n.**

Eryma : 202 nec Meyer, 1840.

Type species, *Eryma stygium* Kriechbaumer, 1891

Included by Kriechbaumer 1891b : 301 (Monobasic)

= *Ctenopelma* Holmgren, [1855] (Roman 1910) (syn. *Neoeryma* Ashmead, 1898 (n.n.))

= *Ctenopelma nigrum* Holmgren, [1855] (Roman 1910)

Ethelurgus : 180.

Type species, *Hemiteles (Ethelurgus) lonicerae* Viereck, 1917

Included by Viereck 1917 : 340 (Monobasic)

= *Ethelurgus syrphicola* (Ashmead, 1890) (Townes 1944)

Eudelus : 179.

Type species, *Hemiteles scabriculus* Thomson, 1884 (By present designation)

= *Eudelus scabriculus* (Thomson, 1884) **comb. n.**

This confirms the supposition of Roman 1925 : 13. *Eudelus* represents a distinct segregate of the genus *Hemiteles* (s.l.)

Eugnomus : 147 nec Schoenherr, 1847.

Type species, *Eugnomus manni* Tschek, 1871

Included by Tschek 1871 : 67 (Monobasic)

= *Eucremastus* Szépligeti, 1905 (Ceballos 1921)

= *Eucremastus manni* (Tschek, 1871) **comb. n.** (syn. *Eucremastus brevicornis* Szépligeti (Ceballos 1921))

Eusterinx : 172.

Type species, *Eusterinx oligomera* Foerster, 1871

Included by Foerster 1871 : 109 (Many species)

Designated by Viereck 1914 : 57

Eutomus : 148 nec Dejean, 1835.

Type species, *Isurgus lanceolatus* Szépligeti, 1899

Eutomus is included as a synonym of *Isurgus* by Szépligeti 1905 : 57-8 (Many species)

Designated by Viereck 1914 : 58

= *Isurgus* Foerster, 1868 (Szépligeti 1905)

Exacrodus : 210.

Type species, *Exacrodus populans* Morley, 1913

Included by Morley 1913 : 330 (Monobasic)

= *Perilissus* Holmgren, [1855] **syn. n.**

= *Perilissus populans* (Morley, 1913) **comb. n.**

Exeristes : 164.

Type species, *Pimpla roborator* (Fabricius) ; Gravenhorst, 1829

Included and designated by Schmiedeknecht 1888 : 448 (Monobasic)

= *Exeristes roborator* (Fabricius, 1793)

Exolytus : 189 Foerster nec Holmgren, 1858.

Type species, *Ichneumon laevigatus* Gravenhorst, 1820

Included and designated by Foerster 1871 : 49

= *Mesoleptus* Gravenhorst, 1829 (Viereck 1912)

= *Mesoleptus laevigatus* (Gravenhorst, 1820)

Foerster describes this genus as new. It is a synonym of and isogenotypic with *Exolytus* Holmgren (= *Mesoleptus* Gravenhorst).

Gambrus : 188.

Type species, *Gambrus (Cryptus) maculatus* Brischke, 1888

Included by Brischke 1888 : 106 (Monobasic)

= *Gambrus incubitor* (Linnaeus, 1758) (Roman 1932)

Gastroporus : 206.

Type species, *Hyperallus caliroae* Viereck, 1911 (By present designation)

= *Hyperallus* Foerster, 1868 **syn. n.**

Cushman 1920 : 264 doubtfully refers *Phthorima borealis* Ashmead to this genus.

Gausocentrus : 198.

Type species, *Gausocentrus gyrini* Ashmead, 1894

Included by Ashmead Jan. 1894 : 25 (Monobasic)

= *Bathythrix* Foerster, 1868 (Townes 1944)

= *Bathythrix gyrini* (Ashmead, 1894)

Gemophaga : 211.

Type species, *Gemophaga rufa* Ashmead, 1902

Included by Ashmead 1902 : 223 (Monobasic)

= *Ctenochira* Foerster, 1855 (Townes & Townes 1949)

= *Ctenochira rufa* (Ashmead, 1902)

Genarches : 200.

Type species, *Mesoleptus facialis* Gravenhorst, 1829

Included by Kriechbaumer 1891 : 45 (Monobasic)

= *Perispuda* Foerster 1868

= *Perispuda facialis* (Gravenhorst, 1829)

Genarches strangulator Foerster MS. is quoted as a synonym of *Perispuda facialis* (Gravenhorst) by Kriechbaumer 1891 and by the first revisor principle, *Genarches* must be taken as a synonym of *Perispuda*.

Giraudia : 184.

Type species, *Cryptus congruens* Gravenhorst, 1829

As *Cryptus congruen* [lapsus pro -ens], included and designated by Ashmead 1900b : 30 (Monobasic)

= *Giraudia gyratoria* (Thunberg, 1822) (Roman 1912)

Glyphicnemis : 181.

Type species, *Phygadeuon vagabundus* Gravenhorst, 1829

Included and designated by Ashmead 1900b : 28 (Monobasic)

= *Glyphicnemis vagabundus* (Gravenhorst, 1829)

Gnathochorisis : 152.

Type species, *Gnathochorisis flavipes* Foerster, 1871

Included and designated by Foerster 1871 : 113 (Monobasic)

Gnesia : 202 nec Doubleday, 1848.

Type species, *Gnesia caliroae* Rohwer, 1915

Included and designated by Rohwer 1915 : 220 (Monobasic)

= *Esigna* n.n.

= *Esigna caliroae* (Rohwer, 1915) **comb. n.**

Gnotus : 179.

Type species, *Hemiteles tenuicornis* Gravenhorst 1829 (By present designation) (from description)

= *Gnotus tenuipes* (Gravenhorst, 1829) **comb. n.** (Pfankuch 1920)

I have taken *tenuicornis* as the type species of the genus as this is based on the female ; the association of the male (*tenuipes*) still remains in some doubt.

Gnypetomorpha : 173.

Type species, *Hemiteles apertus* Thomson, 1884

Included and designated by Roman 1925 : 14 (Four species)

= *Gnypetomorpha aperta* (Thomson, 1884)

Gonolochus : 148.

Type species, *Gonolochus fenestralis* Szépligeti, 1899

Included by Szépligeti 1899 : 227, 243 (Monobasic)

Gonophonus : 169.

Type species, *Gonophonus mokrzeckii* Kokujev, 1902

Included by Kokujev 1902 : 280 (Monobasic)

= *Gonophonus propinquus* (Tschek, 1868) (Clément 1938)

Gonotypus : 153.

Type species, *Gonotypa* [emend. pro -us] *melanostoma* Thomson, 1887

Included by Thomson 1887 : 1137 (Monobasic)

Gunopaches : 174.

Type species, *Gunopaches crassus* Perkins, 1962

= *Phygadeuon* Gravenhorst 1829 **syn. n.**

= *Phygadeuon crassus* (Perkins, 1962) **comb. n.**

Habromma : 176.

Type species, *Habromma nigrum* Ashmead, 1902

Included by Ashmead 1902 : 188 (Monobasic)

= *Phygadeuon* Gravenhorst, 1829 (Townes 1944)

= *Phygadeuon unicinctus* (Ashmead, 1902) (Cushman 1922)

Habronyx 1860 : 145.

Type species, *Habronyx gravenhorstii* Foerster, 1860

Included by Foerster 1860 : 148 (Monobasic)

There is some doubt about the identity of this species.

Hadrodactylus : 199.

Type species, *Ichneumon typhae* Fourcroy, 1785

Included by Woldstedt 1877 : 459 (Two species)

Designated by Viereck 1914 : 65

= *Hadrodactylus typhae* (Fourcroy, 1785)

Hedylus : 183.

Type species, *Hedylus crassicornis* Ashmead, 1898

Included by Ashmead 1898b : 339 (Monobasic)

Helcostizus : 186.

Type species, *Cryptus brachycentrus* Gravenhorst, 1829

Included by Schmiedeknecht 1888 : 441 (One species and one synonym)

Designated by Viereck 1914 : 67

= *Helcostizus albator* (Thunberg, 1822) (Roman 1912)

Hemiphanes : 172.

Type species, *Hemiphanes flavipes* Foerster, 1871

Included by Foerster 1871 : 101 (Two species)

Designated by Viereck 1914 : 68

Heterocola : 148.

Type species, *Thersilochus* [emend. pro *Ter-*] *proboscidalis* Thomson, 1889.

Included by Szépligeti 1899 : 221, 238 (Monobasic) (p. 238 as *Heterocolea* lapsus pro -la)

= *Heterocola proboscidalis* (Thomson, 1889)

Heterotypus : 183.

Type species, *Ichneumon cinctorius* Fabricius, 1775 (By present designation)

= *Apsilops* Foerster, 1868 **syn. n.**

= *Apsilops cinctorius* (Fabricius, 1775)

Hidryta : 187.

Type species, *Brachycryptus erythrocerus* Thomson, 1873

Included by Dalla Torre 1902 : 551 (Four species)

Designated by Viereck 1914 : 69

= *Hidryta sordida* (Tschek, 1870) (Habermehl 1930)

Himerta : 200.

Type species, *Euryproctus* (*Himertus* [emend. pro -a]) *bisannulatus* Thomson, 1883

Included by Thomson 1883 : 927 (Two species)

Designated by Viereck 1914 : 70

= *Himerta bisannulata* (Thomson, 1883)

Kriechbaumer 1897 : 165 places *Euryproctus affinis* Holmgren in this genus stating Foerster's specimen to be this species.

Hodostates : 202.

Type species, *Hodostatus* [emend. pro -es] *brevis* Thomson, 1883

Included by Thomson 1883 : 929 (Monobasic)

= *Hodostates brevis* Thomson, 1883

Holmgrenia : 213.

Type species, *Holmgrenia lanceolata* Davis, 1898

Included by Davis 1898 : 294 (Six species)

Designated by Viereck 1914 : 71

= *Mesoleius* Holmgren, [1855] (Townes 1945)

= *Mesoleius lanceolatus* (Davis, 1898)

Holocremnus : 157.

Type species, *Limneria cothurnata* Holmgren, [1858]

As *Holocremna* [emend. pro -us], included by Thomson 1887 : 1178 (Many species)

Designated by Viereck 1914 : 71

= *Holocremnus cothurnatus* (Holmgren, [1858])

Holocrepis : 193.

Type species, *Holocrepis rufipes* Schmiedeknecht, 1903

Included and designated by Schmiedeknecht 1903 : 297 (Monobasic)

Holomeristus : 171.

Type species, *Holomeristus tenuicinctus* Foerster, 1871

Included and designated by Foerster 1871 : 81 (Monobasic)

Homalomma : 198.

Type species, *Homalomma caliroae* Rohwer, 1915

Included and designated by Rohwer 1915 : 218 (Three species)

= *Lathrolestes* Foerster, 1868 (Townes 1945)

= *Lathrolestes caliroae* (Rohwer, 1915)

Homaspis : 198.

Type species, *Mesoleptus rufinus* Gravenhorst, 1829

Included by Thomson 1894 : 1984 (Four species)

Designated by Viereck 1914 : 71

= *Homaspis rufinus* (Gravenhorst, 1829)

Homelys : 182 nec Meyer 1844.

Type species, *Phygadeuon lapponicus* Thomson, 1884

Included and designated by Viereck 1914 : 71 (Monobasic)

= *Phygadeuon* Gravenhorst, 1829 (Townes 1944)

Roman 1909 : 241 only places *lapponicus* in this genus tentatively ["würde"].

Homobia : 203.

Type species, *Colpotrochia* ? *cinctiventris* Ashmead, 1896

Included by Davis 1897 : 278 (Monobasic)

= *Xenoschesis* Foerster, 1868 (Cushman, 1937)

= *Xenoschesis cinctiventris* (Ashmead, 1896)

Homotherus : 185.

Type species, *Ichneumon locutor* Thunberg, 1822

Included and designated by Heinrich 1960 : 17

= *Homotherus locutor* (Thunberg, 1822)

Homotropus : 162.

Type species, *Bassus elegans* Gravenhorst, 1829

As *Homoporus* [lapsus pro *Homotropus*], included by Thomson 1890 : 1488 (Many species)

Designated by Viereck 1912a : 175

= *Homotropus elegans* (Gravenhorst, 1829)

Homocidus Morley, being a new name for *Homoporus*, must have the same type. If *Homoporus* is considered a lapsus for *Homotropus*, then this species automatically becomes the type of *Homotropus* (cf. Walkley in Krombein *et al.* 1958 : 57).

For the moment, I regard *Homotropus* as being distinct from *Syrphoctonus*; if the genera are synonymized then *Homotropus* is a synonym of *Syrphoctonus* (Benoit 1955).

Hoplitophrys : 164.

Type species, *Glypta brischkei* Holmgren, [1860]

Included by Schmiedeknecht 1888 : 431 (Monobasic)

= *Hoplitophrys brischkei* (Holmgren, [1860])

If this species is regarded as belonging to *Teleutaea* (Hellén 1915) then the latter name should be used.

Horogenes : 152.

Type species, *Campoplex tenuiventris* Gravenhorst, 1829

Included by Brischke 1880 : 147 (Monobasic)

= *Casinaria* Holmgren, [1858] **syn. n.**

= *Casinaria tenuiventris* (Gravenhorst, 1829)

Horogenes Foerster auctt. nec Foerster.

= *Nythobia* Foerster, 1868

Little has been published on the Campoplegini for a considerable time and the classification of the group is somewhat chaotic. Of the synonyms at present listed under *Horogenes* auctt., *Diadegma* is the oldest; however this belongs, with *Zaporus*,

to *Meloboris* which seems to me to be as valid a segregate as the other recognized genera of the group of Campoplegini having the nervellus unbroken, the glymmae present and the postpetiole carinate laterally. The next available listed name is *Enytus* Cameron, 1905 (Type species *E. maculipes* Cameron = *eureka* Ashmead) ; this species has an open areolet.

However, taking a broad view of the genera, until such time as a world revision can be undertaken, it seems to me that *Nythobia* Foerster could be used for the group. This genus has been recognized only on the open areolet and short ovipositor ; the latter character applies to the type species, *pusio* (Holmgren), but as pointed out by Thomson, *elishae* (Bridgman) differs from this mainly in having a more elongate ovipositor, and his *nanus* (Gravenhorst) group with a partially closed areolet seem also to be related to *pusio* and they have the ovipositor longer still. It would appear, therefore, best for the present to use *Nythobia* for *Horogenes* auctt.

***Hybophanes* : 166.**

Type species, *Tryphon scabriculus* Gravenhorst, 1829

Included by Schmiedeknecht 1888 : 435 (Three species)

Designated by Viereck 1914 : 72

= *Hybophanes scabriculus* (Gravenhorst, 1829)

***Hybristes* : 210 nec Reichenbach, 1850.**

***Hypamblys* : 212.**

Type species, *Mesoleius transfuga* Holmgren, [1855]

As *Syndipnus* (*Hypamblys*) *transfuga*, included by Thomson 1894 : 2008 (Four species)

Designated by Viereck 1914 : 73

= *Hypamblys albopictus* (Gravenhorst, 1829) (Pfankuch 1907)

***Hyperallus* : 210.**

Type species, *Hyperallus caliroae* Viereck, 1911

Included by Viereck 1911a : 189 (Monobasic)

***Hyperbatus* : 210.**

***Hypocryptus* : 198.**

Type species, *Mesoleptus* (*Hypocryptus*) *testaceicornis* Brischke, 1892

Included by Brischke 1892 : 33 (Monobasic)

***Hypoleptus* : 159.**

Type species, *Hypoleptus columbianus* Ashmead, 1896

Included by Ashmead 1896a : 203 (Monobasic)

= *Stenomacrus* Foerster, 1868 (Townes 1945)

= *Stenomacrus columbianus* (Ashmead, 1896)

***Hyposoter* : 152.**

Type species, *Limnerium* (*Hyposoter*) *parorgyiae* Viereck, 1910

Included and designated by Viereck 1910 : 383 (Monobasic)

= *Hyposoter parorgyiae* (Viereck, 1910)

***Hypothereutes* : 156.**

Type species, *Hypotherentes* [lapsus pro *-reutes*] *geometrae* Ashmead, 1898

Included by Ashmead, 1898a : 167 (Monobasic)

= *Phobocampe* Foerster, 1868 (Townes 1945)

= *Phobocampe geometrae* (Ashmead, 1898)

***Ichnaeops* : 197.**

Type species *Perilissus lutescens* Holmgren, [1855] (By present designation)

= *Perilissus* Holmgren, [1855] **syn. n.**

***Idechthis* : 154 nec Huebner, 1821.**

Type species, *Idechthis oahuensis* Ashmead, 1901

Included by Ashmead 1901 : 355 (Monobasic)

= *Exidechthis* Walkley, 1958 (n.n.)

= *Exidechthis canescens* (Gravenhorst, 1829) (Morley 1915)

***Idemum* : 179.**

Type species, *Hemiteles* (*Idemum*) *crassiformis* Viereck, 1917

Included by Viereck 1917 : 340 (Monobasic)

= *Idemum crassiformis* (Viereck, 1917)

***Idiogramma* : 163.**

Type species, *Idiogramma euryops* Schmiedeknecht, 1888

Included by Schmiedeknecht 1888 : 429 (Monobasic)

***Idiolispa* : 188.**

Type species, *Bassus analis* Gravenhorst, 1807

Included by Tschek 1870 : 126, 127 (Two species)

Designated by Viereck 1914 : 75

= *Idiolispa analis* (Gravenhorst, 1807)

***Idiostolis* : 190.**

Type species, *Hoplismenus cothurnatus* Gravenhorst, 1829 (By present designation)

= *Poecilostictus* Ratzeburg, 1852 **syn. n.** (syn. *Neoplatylabus* Heinrich, 1936)

= *Poecilostictus cothurnatus* (Gravenhorst, 1829)

***Idioxenus* : 171.**

Type species, *Megastylus mediator* Schiødte, 1839

Included and designated by Foerster 1871 : 94 (Many species)

= *Helictes* Curtis, 1837 (Dalla Torre 1901)

= *Helictes mediator* (Schiødte, 1839)

***Ilapinastes* : 179.**

Type species, *Hemiteles* (*Ilapinastes*) *davidsonii* Ashmead, 1896

Included by Ashmead in Davidson 1896 : 320 (Monobasic)

(Ashmead quotes "The species evidently belongs to Foerster's subgenus *Ilapinastes* ")

= *Gelis* Thunberg, 1827 (Townes 1944)

= *Gelis davidsonii* (Ashmead, 1896)

***Ipoctonus* : 199** nec Heine, 1860.

Type species, *Mesoleptus chrysostomus* (Gravenhorst) Holmgren, [1856]

Included by Thomson 1889a : 1432 (Three species)

Designated by Viereck 1914 : 76

= *Ipoctoninus* Hincks, 1944 (n.n.)

= *Ipoctoninus chrysostomus* (Gravenhorst, 1820)

***Isadelphus* : 177.**

Type species, *Hemiteles inimicus* Gravenhorst, 1829

Included by Roman 1909 : 234 (Three species and two synonyms)

Designated by Viereck 1914 : 76

= *Mastrus* Foerster, 1868 (Townes 1944)

= *Mastrus inimicus* (Gravenhorst, 1829)

***Ischnobatis* : 148.**

Type species, *Thersilochus* [emend. pro *Ter*-] (*Ichnobatis* Fst. [lapsus pro *Ischobatis*])
stramineipes Brischke 1880

Included by Brischke 1880 : 194 (Monobasic)

= *Ischnobatis stramineipes* (Brischke), 1880 (syn. *Luchatema* Walkley, 1956, *Temelucha* auctt. nec type species)

Viereck 1914, quotes *Porizon nigritulus* Gravenhorst as the type species of a monobasic genus. This is invalid as Brischke placed *stramineipes* Brischke and ? *nigritulus* Gravenhorst in the subgenus *Ischnobatis*, so only one species was definitely included.

Hellén 1958 : 17 regards *Ischnobatis* as a synonym of *Phradis*.

***Ischnoscopus* : 156.**

Type species, *Ischnoscopus synchlora* Ashmead, 1898

Included by Ashmead 1898a : 168 (Monobasic)

= *Hyposoter* Foerster, 1868 (Gahan 1914)

= *Hyposoter synchlora* (Ashmead, 1898)

***Ischnurgops* : 175.**

Type species, *Cryptus claviger* Taschenberg, 1865

Included and designated by Viereck 1914 : 77 (Monobasic)

Synonymized with *Leptocryptus* Thomson by Roman 1909 : 236 without included species.

= *Bathythrix* Foerster, 1868 (Townes 1944)

= *Bathythrix claviger* (Taschenberg, 1865)

***Ischyra* : 175.**

Type species, *Catomicrus alpigenus* Strobl, 1904 (syn. *Strobilia alpigena* (Strobl) (Schmiedeknecht 1911), *Acanthostrobilia alpigena* (Strobl) (Roman 1925)) (By present designation)

syn. *Strobilia* Schmiedeknecht, 1911 nec Pokorný, 1893, *Acanthostrobilia* Roman, 1925

syn. n.

= *Ischyra* *alpigenus* (Strobl, 1904) **comb. n.**

The first inclusion of a name in this genus is *Ichyracis* [sic] *americanus* Ashmead MS. by Slosson 1906 : 324 ; then later as *Ichyracis* [sic] *Ischyracis americanus* Ashmead MS. by Cushman 1922 : 16. Neither has any specific description.

***Isdromas* : 180.**

Type species, *Acrolyta aletia* Ashmead, 1896

As *Isodromas* [lapsus pro *Isdr-*], included by Ashmead in Smith 1900a : 569 (Monobasic)

= *Isdromas lycaenae* (Howard, 1889) (Townes 1944)

***Iselix* : 182.**

Type species, *Phygadeuon nitidus* Gravenhorst, 1829

Included by Dalla Torre 1902 : 703 (Many species)

Designated by Viereck 1914 : 78

= *Phygadeuon* Gravenhorst, 1829

This is considered by some authors as a subgenus of *Phygadeuon*.

***Iseropus* : 164.**

Type species, *Ichneumon graminellae* Schrank, 1802

Included by Woldstedt 1877 : 443 (Monobasic)

= *Iseropus stercorator* (Fabricius, 1793)

***Isochresta* : 181.**

Type species, *Isochresta uncinata* Ashmead, 1902

Included by Ashmead 1902 : 190 (Monobasic)

= *Phygadeuon* Gravenhorst, 1829 (Townes 1944)

= *Phygadeuon uncinatus* (Ashmead, 1902)

***Isodiaeta* : 204.**

Type species, *Tryphon segmentarius* (Fabricius), Gravenhorst 1829 ; ? of Fabricius 1787 (By present designation)

This interpretation of the genus follows the Kriechbaumer Collection : no Foerster specimen was found.

= *Barytarbes* Foerster, 1868 **syn. n.**

= *Barytarbes segmentarius* (Fabricius), 1787 (Pfankuch 1906)

***Isotima* : 182.**

Type species, *Isotima albicincta* Ashmead, 1905

Included by Ashmead 1905b : 407 (Four species)

Designated by Townes 1957 : 109

***Isurgus* : 148.**

Type species, *Isurgus lanceolatus* Szépligeti, 1899

Included by Szépligeti 1899 : 224, 241 (Many species)

Designated by Viereck 1914 : 78

***Itamoplex* : 188.**

Type species, *Cryptus americanus* Cresson, 1864

Included by Ashmead in Smith 1900a : 570 (Three species)

Designated by Viereck 1914 : 79

=*Cryptus* Fabricius, 1804 (Viereck 1914)

=*Cryptus americanus* Cresson, 1864

There is some doubt concerning the usage of the specific name *albitarsis*. Dalla Torre 1902 : 560, by the form of his reference, regarded *Ischnus albitarsis* Cresson, 1864 (transferred to *Cryptus*) as a homonym of *Cryptus albitarsis* Cresson, 1864 (now transferred to *Trychosis*). I therefore prefer to use the name *americanus* of which *Ischnus albitarsis* is a synonym.

Itamus : 179 nec Schmidt-Goebel, 1846.

Type species, *Hemiteles (Itamus) okamotoi* Uchida, 1936

Included by Uchida 1936 : 13 (Monobasic)

=*Uchidella* Townes, 1957 (n.n.)

=*Uchidella marginatus* (Uchida, 1930) (Townes 1957)

Ithagenes 158 nec Agassiz, 1846 [emend. pro *Ithaginis* Wagler, 1832].

Itopectis : 164.

Type species, *Ichneumon scanicus* Villers, 1789

Included by Woldstedt 1877 : 443 (Two species)

Designated by Viereck 1914 : 79

=*Itopectis maculator* (Fabricius, 1775)

Designations of *Ichneumon maculator* Fabricius by Ashmead 1900 (as *maculata* [sic]) and by Morley 1913 : 169 appear to be invalid as this species, as such, was not included by Woldstedt although now *scanicus* is believed to be a synonym of *maculator*.

Kaltenbachia : 187.

Type species, *Cryptus ornatus* Gravenhorst, 1829

Included by Dalla Torre 1902 : 551 (Seven species) (see antea, p. 391)

Designated by Viereck 1914 : 80

=*Gambrus* Foerster, 1868 (Dalla Torre 1902)

=*Gambrus incubitor* (Linnaeus, 1758) (Roman 1932)

Brischke 1891, quotes *Cryptus ornatus* Grav.? as belonging to this genus. As this is an inclusion of a doubtful species in the genus it should be disregarded and the Dalla Torre reference then becomes valid, quoting *Kaltenbachia* as a synonym of *Gambrus*.

Labroctonus : 195.

Type species, *Tryphon articulatus* Cresson, 1868

Included by Davis 1897 : 249 (Monobasic)

=*Polyblastus (Labroctonus)* (Townes & Townes 1949)

=*Polyblastus (Labroctonus) articulatus* (Cresson, 1868)

Labrorychus : 146.

Type species, *Anomalon nigricorne* Wesmael, 1849

Included by Brischke 1880 : 137 (Monobasic)

This genus is therefore isotypic with *Blaptocampus* Thomson

syn. *Blaptocampus* Thomson, 1892 **syn. n.**

=*Labrorychus nigricornis* (Wesmael, 1849)

The above type designation quite alters the usage of *Labrorychus*. Until a complete generic revision is undertaken, it seems inadvisable to describe a new genus for *Labrorychus* auctt., which could perhaps at the moment, be placed in *Barylypa*.

***Labrossyta* : 202.**

Type species, *Ichneumon scotopterus* Gravenhorst, 1820

As *Labrossytus* [emend. pro -a], included by Thomson 1894 : 2001 (Monobasic)

= *Labrossyta scotoptera* (Gravenhorst, 1820)

***Laepserus* : 205.**

Type species, *Blapticus crassulus* Thomson, 1888 (By present designation)

syn. *Acroblapticus* Schmiedeknecht, 1911 **syn. n.**

= *Laepserus crassulus* (Thomson 1888) **comb. n.**

***Lagarotis* : 205.**

Type species, *Ichneumon semicaligatus* Gravenhorst, 1820

As *Lagarotus* [emend. pro -is], included by Thomson 1892a : 1881 (Four species and three synonyms)

Designated by Viereck 1914 : 81

= *Lagarotis semicaligatus* (Gravenhorst, 1820)

***Lamachus* : 206.**

Type species, *Tryphon lophyrorum* Hartig, 1838

Included by Thomson 1892a : 1877 (Six species)

Designated by Viereck 1914 : 81

= *Lamachus lophyrorum* (Hartig, 1838)

***Laphyctes* : 146 nec Dujardin, 1845.**

Type species, *Laphyctes insidiator* Foerster, 1878

Included by Foerster 1878 : 73 (Three species)

Designated by Viereck 1914 : 82

= *Barylypa* Foerster, 1868 (Szépligeti 1905) (syn. *Sarntheinia* Dalla Torre, 1901 (n.n.))

= *Barylypa insidiator* (Foerster, 1878)

***Laphyroscopus* : 197.**

Type species, *Tryphon gorskii* Ratzeburg, 1852

As *Luphyroscopus* [lapsus pro *Laph*-], included by Thomson 1883 : 915 (Three species)

Designated by Viereck 1914 : 87.

= *Lathrolestes* Foerster, 1868 (Townes 1945)

= *Lathrolestes luteolator* (Gravenhorst, 1829) (Pfankuch 1906)

***Lathiponus* : 198.**

Type species, *Mesoleius (Lathiponus) pulcherrimus* Thomson, 1888

Included by Thomson 1888a : 1261 (Monobasic)

= *Lathiponus frigidus* (Woldstedt, 1872) (Hellén 1953)

Lathrolestes : 196.

Type species, *Tryphon clypeatus* Zetterstedt, 1838

As *Lathrolestes* [emend. pro -es], included by Thomson 1883 : 916 (Seven species and one synonym)

Designated by Viereck 1914 : 82

= *Lathrolestes clypeatus* (Zetterstedt, 1838)

Lathrophagus : 213.

Type species, *Mesoleius buccatus* Holmgren, [1855] (By present designation)

= *Hyphamblys* Foerster, 1868 **syn. n.**

= *Hyphamblys buccatus* (Holmgren, [1855])

Lathroplex : 154.

Type species, *Lathroplex clypearis* Thomson, 1887

Included by Thomson 1887 : 1135 (Monobasic)

Lathrostizus : 154.

Type species, *Lathrostiza* [emend. pro -us] *sternocera* Thomson, 1887

Included by Thomson 1887 : 1152 (Two species)

Designated by Viereck 1914 : 82

= *Lathrostizus sternocerus* Thomson, 1887

Leptodemas : 182.

Type species, *Leptodemas cariniscutis* Cameron, 1906

Included by Cameron 1906a : 330 (Monobasic)

= *Deloglyptus* Wesmael, 1844 **syn. n.**

= *Deloglyptus cariniscutis* (Cameron, 1906) **comb. n.**

This species is probably conspecific with *pubibundus* (Wesmael, 1844)

Leptopygus : 148.

Type species, *Porizon harpurus* (Schrank) ; Gravenhorst, 1829

Included by Thomson 1889 : 1366 (Two species)

Designated by Viereck 1914 : 84

= *Leptopygus harpurus* (Schrank, 1802)

Liopsis : 162.

Type species, *Bassus sulcator* Gravenhorst, 1829

As a synonym of *Promethes*, included by Morley 1911 : 116 (Many species)

Designated by Viereck 1912a : 177

= *Promethes* Foerster, 1868

= *Promethes sulcator* (Gravenhorst, 1829)

Listrota : 209.

Type species, *Phobetres canadensis* Harrington, 1894

Included by Davis 1898 : 289 (Monobasic)

= *Polyterus* Foerster, 1868 (Townes 1945)

= *Polyterus canadensis* (Harrington, 1894)

Lymeon : 176.

Type species, *Lymeon annulicornis* Ashmead, 1894

Included by Ashmead 1894a : 243 (Monobasic)

=*Lymeon orbum* (Say, 1836) (Cushman and Gahan 1921)

Lysibia : 175.

Type species, *Tryphon nanus* Gravenhorst, 1829 (By present designation)

syn. *Haplaspis* Townes, 1944 **syn. n.**

=*Lysibia nana* (Gravenhorst, 1829) **comb. n.**

Mastrus : 176.

Type species, *Phygadeuon (Mastrus) neodiprioni* Viereck, 1911

Included by Viereck 1911a : 195 (Monobasic)

=*Mastrus argeae* (Viereck, 1911) (Townes 1944)

Medophron : 185.

Type species, *Medophron niger* Brischke, 1881

Included by Brischke 1881 : 344 (Monobasic)

=*Medophron afflictor* (Gravenhorst, 1829) (Schmiedeknecht 1905)

This genus will probably prove to be a segregate from *Phygadeuon* as was proposed by Roman 1914.

Megaplectes : 186.

Type species, *Ichneumon monticola* Gravenhorst, 1829

Included by Schmiedeknecht 1890 : 87 (Monobasic)

=*Megaplectes monticola* (Gravenhorst, 1829)

Meringopus : 186.

Type species, *Cryptus recreator* Fabricius, 1804

Included by Tschek 1870 : 115 (Monobasic)

=*Cryptus* Fabricius, 1804

=*Cryptus recreator* Fabricius, 1804 (syn. *C. obscurus* (Gmelin) Gravenhorst, 1829)

Mesochlistus : 168.

Type species, *Acoenites rufipes* Gravenhorst, 1829

Included by Schmiedeknecht 1888 : 424 (Monobasic)

=*Mesochlistus rufipes* (Gravenhorst, 1829)

Metacoelus : 161.

Type species, *Exochus femoralis* (Fourcroy) ; Gravenhorst, 1829

Included by Holmgren 1873 : 61 (Four species)

Designated by Viereck 1914 : 93

=*Hypsicera* Latreille, 1829

=*Hypsicera femoralis* (Fourcroy, 1762)

Micromonodon : 183.

Type species, *Hemicryptus tener* Kriechbaumer, 1893

Included by Dalla Torre 1902 : 702 (Monobasic)

=*Micromonodon tener* (Kriechbaumer, 1893)

Micrope : 193.

Type species, *Phaeogenes macilentus* Wesmael, 1844

Included by Thomson, 1891 : 1627 (Monobasic)

= *Micrope macilenta* (Wesmael, 1844)

Microplectron : 195 nec Streubel, 1842.

Type species, *Exenterus jucundus* Holmgren, [1855]

Included by Dalla Torre 1901 : 344 (Two species)

Designated by Viereck 1914 : 95

= *Smicroplectrus* Thomson 1883

= *Smicroplectrus jucundus* (Holmgren, [1855])

Microplex : 175.

Type species, *Aclastus rufipes* Ashmead, 1902

Included by Roman 1909 : 235 (Monobasic)

= *Gnyptetomorpha* Foerster, 1868 (Townes 1944)

= *Gnyptetomorpha rufipes* (Ashmead, 1902)

Microtorus : 178.

Type species, *Microtorus kichijoi* Uchida, 1940 (n.n. for *Hemiteles* (*Rhadiurgus*) *chrysopae* Uchida, 1933)

Included by Uchida 1940 : 66 (Two species)

Designated by Townes 1957 : 111

= *Dichrogaster* Doumerc, 1855 **syn. n.**

= *Dichrogaster kichijoi* (Uchida, 1940) **comb. n.**

Miomeris : 171.

Type species, *Miomeris aquisgranensis* Foerster, 1871

Included and designated by Foerster 1871 : 92 (Monobasic)

Mnesidacus : 159.

Type species, *Mnesidaecus* [lapsus pro *-dacus*] *apicalis* Ashmead, 1896

Included by Ashmead 1896a : 202 (Monobasic)

= *Mnesidacus nigricoxus* (Provancher, 1888)

Moerophora : 169.

Type species, *Xylonomus rufipes* Gravenhorst, 1829

Included by Woldstedt 1881 : 61 (Monobasic)

= *Moerophora rufipes* (Gravenhorst, 1829)

Myriarthrus : 172. n.n. for *Helictes* Haliday in Curtis, 1838.

Type species, *Plectiscus erythrostoma* (Gmelin) ; Gravenhorst, 1829

= *Helictes erythrostoma* (Gmelin, 1790)

Naetes : 179.

Type species, *Hemiteles* (*Naites* [sic]) *rufus* Brischke, 1892 (a homonym of *Hemiteles rufus* Taschenberg, 1876)

Included by Brischke 1892 : 49 (Monobasic)

= *Orthizema* Foerster, 1868 **syn. n.**

= *Orthizema hadrocerus* (Thomson, 1884) **syn. n. comb. n.**

Narcopoea : 204.

Type species, *Mesoleptus typhae* (Fourcroy) ; Gravenhorst, 1829

Included by Kriechbaumer 1891a : 137 (Monobasic)

= *Hadrodactylus* Foerster, 1868 **syn. n.**

= *Hadrodactylus typhae* (Fourcroy, 1785)

Narcopoea singularis Foerster MS. is stated to be a malformed specimen of *Mesoleptus typhae*.

Neales : 204.

Type species, *Tryphon vepretorum* Gravenhorst, 1829

Included by Kriechbaumer 1897 : 169 (Monobasic)

= *Otlophorus* Foerster, 1868

= *Otlophorus vepretorum* (Gravenhorst, 1829)

Neleges : 204.

Type species, *Tryphon proditor* Gravenhorst, 1829

Included by Pfankuch 1907 : 147 (Monobasic)

= *Neleges proditor* (Gravenhorst, 1829)

Townes & Townes 1950 have synonymized this genus with *Monoblastus* Hartig 1837.

Neleophron : 184.

Type species, *Cryptus arrogans* Gravenhorst, 1829 (By present designation)

= *Polytribax* Foerster, 1868 **syn. n.**

= *Polytribax arrogans* (Gravenhorst, 1829) **comb. n.**

Neleothymus : 200.

Type species, *Neleothymus* ? *rufo-ornatus* Cameron, 1905

Included and designated by Townes 1945 : 693

= *Neleothymus rufoornatus* Cameron, 1905

Neotypus : 194.

Type species, *Ichneumon lapidator* Fabricius, 1793 nec 1787

Included by Holmgren 1871 : 292 (Two species)

As *lepidator* [lapsus pro *lap*-], designated by Ashmead 1900b : 20

= *Neotypus nobilitator* (Gravenhorst, 1807)

Nepiera : 156.

Type species, *Limneria concinna* Holmgren, [1858]

Included by Thomson 1887 : 1137 (Monobasic)

= *Nepiera collector* (Thunberg, 1822) (Roman 1912)

Nepiesta : 152.

Type species, *Nepiesta subclavata* Thomson, 1887

Included by Thomson 1887 : 1116 (Three species and one synonym)

Designated by Viereck 1914 : 100

Noemon : 207.

Type species, *Noemon palmaris* Davis, 1898

Included by Davis 1898 : 287 (Three species)

Designated by Viereck 1914 : 101

=*Tryphon* (*Noemon*) Foerster, 1868 (Townes & Townes 1950)

=*Tryphon* (*Noemon*) *palmaris* (Davis, 1898)

Notomeris : 201.

Type species, *Notomeris difformis* Holmgren, [1855]

As *Adelognathus* (*Notomeris*), included by Thomson 1888b : 1278 (Monobasic)

=*Notomeris difformis* (Holmgren, [1855])

Notosemus : 194.

Type species, *Notosemus dives* Brischke, 1887

Included by Brischke 1887 : 88 (Monobasic)

=*Notosemus bohemani* (Wesmael, 1855)

Nuneches : 186.

Type species, *Phygadeuon sodalis* Taschenberg, 1865 (By present designation)

=*Ethelurgus* Foerster, 1868 **syn. n.**

=*Ethelurgus sodalis* (Taschenberg, 1865) **comb. n.**

Nythobia : 153.

Type species, *Meloboris pusio* Holmgren, [1858]

Included by Schmiedeknecht 1907a : 599 (Monobasic)

=*Nythobia pusio* (Holmgren, [1858])

Nythophona : 207.**Nyxeophilus** Foerster : 187.

Type species, *Cryptus bimaculatus* Gravenhorst, 1829

=*Nyxeophilus bimaculatus* (Gravenhorst, 1829)

Nyxeophilus : Thomson, 1885 nec Foerster, 1868.

Type species, *Nyxeophilus bimaculatus* Thomson, 1885

Included and designated by Thomson 1885 : 18 (Two species)

=*Nyxeophilus angusta* (Dalman, 1823)

Thomson, in the above reference, gives *Nyxeophilus mihi* and in 1897 : 2363 refers to *Nyxeophilus* Thomson. The first inclusion of species in *Nyxeophilus* Foerster is by Dalla Torre 1901 : 399, where *Cryptus bimaculatus* Gravenhorst is included as a synonym. This species was selected as the type of *Nyxeophilus* Foerster by Viereck 1914 : 102.

Ocymorus : 180.

Type species, *Hemiteles cingulator* Gravenhorst, 1829

Included and designated by Townes 1944 : 208

=*Hemiteles* Gravenhorst, 1829 (Isogenotypic) (Townes 1944)

=*Hemiteles bipunctator* (Thunberg, 1822) (Roman 1912)

Ocymorus is quoted as a synonym of *Leptocryptus* Thomson by Roman 1909 : 236 but without included species.

Odinophora : 163.

Type species, *Lissonota dorsalis* Gravenhorst, 1829

Included by Schmiedeknecht 1907 : 1158 (Three species)

Designated by Viereck 1914 : 102

= *Odinophora dorsalis* (Gravenhorst, 1829)

Odontoneura : 185.

Type species, *Phygadeuon annulicornis* Thomson, 1884 (By present designation)

This, very probably, will be recognized as a distinct segregate of *Phygadeuon*.

Odontopsis : 150 nec Hasselt, 1823.

Type species, *Gravenhorstia picta* Boie, 1836

Included by Dalla Torre 1901 : 200 (Monobasic)

= *Gravenhorstia* Boie 1836

Oetophorus : 196. (In the index : 218, given as *Oeth-*)

Type species, *Mesoleius stretchii* Cresson, 1878

Included by Davis 1897 : 252 (Four species)

Designated by Viereck 1914 : 104

= *Perilissus* Holmgren, [1855] (Townes 1945, Burks 1952)

= *Perilissus stretchii* (Cresson, 1878)

Olesicampe : 153.

Type species, *Campoplex longipes* (Mueller) ; Gravenhorst, 1829

As *Olesicampa* [emend. pro -e], included by Thomson 1887 : 1142 (Many species)

Designated by Viereck 1912 : 45

= *Olesicampe longipes* (Mueller, 1776)

Olethrodotis : 151.

Oligoplectron : 161 n.n. for *Periope* Curtis, 1829.

Type species, *Periope auscultator* Haliday, 1839

= *Periope* Curtis, 1829

Omoborus : 154.

Type species, *Omoborus kincaidi* Davis, 1898

Included by Davis 1898a : 363 (Monobasic)

= *Olesicampe* Foerster, 1868 (Townes 1945)

= *Olesicampe kincaidi* (Davis, 1898)

Omorgus : 154 nec Erichson, 1847.

Type species, *Limneria mutabilis* Holmgren, [1858]

As *Omorga* [emend. pro -us], included by Thomson 1887 : 1125 (Many species)

Designated by Viereck 1912c : 642

= *Campoplex* Gravenhorst, 1829 (Viereck 1912)

= *Campoplex lineolatus* Ratzeburg, 1844 (Strobl 1901)

Oneista : 207.

Type species, *Oneista bohemani* Kriechbaumer, 1892

Included by Kriechbaumer 1892 : 41 (Monobasic)

= *Lagarotus* Foerster, 1868 (Roman 1909)

= *Lagarotus ustulatus* (Holmgren, [1855]) (Roman 1909)

Opidnus : 185.

Type species, *Aptesis* (*Pezoporus*) *tsugae* Cushman, 1939
Included and designated by Townes & Townes 1951 : 256
=*Opidnus tsugae* (Cushman, 1939)

Opisthostenus : 175.

Type species, *Hemiteles* (*Opisthostenus*) *etorofuensis* Uchida, 1936
Included by Uchida 1936a : 43 (Monobasic)
=*Gnyptomorphia* Foerster, 1868 (Townes 1957)
=*Gnyptomorphia etorofuensis* (Uchida, 1936)

Orthizema : 178.

Type species, *Hemiteles* (*Orthizema*) *ornatus* Brischke, 1890
Included by Brischke 1890 : 106 (Monobasic)
=*Orthizema subannulatus* (Bridgman, 1883) **comb. n.**

Otacustes : 174.

Type species, *Otacustes atriceps* Ashmead, 1894
Included by Ashmead 1894a : 244 (Two species)
Designated by Viereck 1914 : 107
=*Dichrogaster* Doumerc, 1855 **syn. n.**
=*Dichrogaster crassus chrysopae* (Ashmead, 1894) (Cushman 1935, Townes 1944)
comb. n.

Otitochilus : 203.

Type species, *Tryphon trochanteratus* Holmgren, [1855]
As *Tryphon* (*Otitochilus*) *trochanteratus*, included by Woldstedt 1877 : 460 (Two species)
Designated by Viereck 1914 : 108
=*Tryphon* Fallén, 1813 (Townes 1944)

Otlophorus : 202.

Type species, *Tryphon vepretorum* Gravenhorst, 1829
Included by Thomson 1895 : 2026 (Five species)
Designated by Viereck 1914 : 108
=*Otlophorus vepretorum* (Gravenhorst, 1829)

Otoblastus : 201.

Type species, *Tryphon luteomarginatus* Gravenhorst, 1829
Included by Thomson 1883 : 900 (Monobasic)
=*Otoblastus luteomarginatus* (Gravenhorst, 1829)
Townes & Townes 1950 synonymize this genus with *Monoblastus* Hartig, 1837.

Oxyrrhexis : 166.

Type species, *Cryptus carbonator* Gravenhorst, 1807
Included and designated by Schiedeknecht 1888 : 432 (Monobasic)
=*Oxyrrhexis carbonator* (Gravenhorst, 1807)

Oxytaenia : 182.

Type species, *Oxytaenia rufolineata* Cameron, 1904

Included by Cameron 1904 : 254 (Monobasic)

Oxytorus : 199.

Type species, *Oxytorus armatus* Thomson, 1883

Included by Thomson 1883 : 910 (Monobasic)

Pammachus : 185.

Type species, *Stenocryptus nigriventris* Thomson, 1873

Included by Dalla Torre 1902 : 697 (Three species)

Designated by Viereck 1914 : 109

= *Cubocephalus* Ratzeburg, 1848 (Dalla Torre 1902)

= *Cubocephalus oviventris* (Gravenhorst, 1829)

Pammicra : 181.

Type species, *Hemiteles dorsalis* Gravenhorst, 1829

As *Pammicrus* [emend. pro -a], included by Thomson 1883 : 880 (Monobasic)

= *Pammicra dorsalis* (Gravenhorst, 1829)

Panargyrops : 182.

Type species, *Cryptus claviger* Taschenberg, 1865

Included by Schmiedeknecht 1888 : 435 (Two species)

Designated by Viereck 1914 : 109

= *Bathythrix* Foerster, 1868 (Townes 1944)

= *Bathythrix claviger* (Taschenberg, 1865)

Panteles : 165.

Type species, *Brachypimpla* ? *schuetzeana* Roman, 1925

Included by Roman 1931 : 25 (Monobasic)

= *Panteles schuetzeana* (Roman, 1925)

Ashmead in Smith 1900a : 575 quotes *Panteles mellithorax* Ashmead ; this however is a nomen nudum.

Pantisarthrus 1871 : 109.

Type species, *Pantisarthrus inaequalis* Foerster, 1871

Included by Foerster 1871 : 110 (Three species)

Designated by Viereck 1914 : 110

Pantolispa : 178.

Type species, *Gunopaches crassus* Perkins, 1962

= *Gunopaches* Foerster 1868 (**syn. n.**) (= *Phygadeuon* Gravenhorst 1829)

= *Phygadeuon crassus* (Perkins, 1962)

Pantoporthus : 209.

Type species, *Ichneumon luridator* Gravenhorst, 1820 (By present designation)

= *Oxytorus* Foerster, 1868 **syn. n.**

= *Oxytorus luridator* (Gravenhorst, 1820)

Pantorhaestes : 206.

Type species, *Tryphon xanthostomus* Gravenhorst, 1829

Included by Pfankuch 1906 : 83 (One species and two synonyms)

Designated by Viereck 1914 : 110

= *Pantorhaestes xanthostomus* (Gravenhorst, 1829)

Pantropa : 155.**Parabates** : 150.

Type species, *Parabatus* [emend. pro -es] *nigricarpus* Thomson, 1888

Included by Thomson 1888 : 1196 (Four species)

Designated by Enderlein 1912 : 106

= *Parabates nigricarpus* Thomson, 1888

Townes 1938 regarded this as a subgenus of *Netelia* Gray, 1860.

Paraphylax : 176.

Type species, *Paraphylax fasciatipennis* Ashmead, 1904

Included by Ashmead 1904 : 141 (Monobasic)

Paraplesius : 207.**Pemon** : 174.

Type species, *Pemon proximum* Perkins, 1962

= *Lysibia* Foerster 1868 **syn. n.**

= *Lysibia proxima* (Perkins, 1962) **comb. n.**

Perispuda : 205.

Type species, *Mesoleptus facialis* Gravenhorst, 1829

As *Perispudus* [emend. pro -a], included by Thomson 1888a : 1261 (Monobasic)

= *Perispuda facialis* (Gravenhorst, 1829)

Peritaenius : 190.

Type species, *Peritaenius bavaricus* Clément, 1927

Included and designated by Clément 1927 : 75 (Five species)

= *Hoplismenus* Gravenhorst, 1829 (Heinrich 1949)

= *Hoplismenus istrianus* (Clément, 1927) (Heinrich 1949)

Perosis : 169.

Type species, *Echthrus armatus* Gravenhorst, 1829

Included by Schmiedeknecht 1888 : 441 (Monobasic)

Designated by Viereck 1914 : 113

= *Mastrus* Foerster, 1868 **syn. n.**

= *Mastrus armatus* (Gravenhorst, 1829) **comb. n.**

Roman 1914 placed this species in *Cecidonomus* Bridgman, the name by which *Mastrus* was known in Europe for many years.

Perosis Foerster auctt. nec Foerster should therefore take the name *Sycophrurus* Picard, 1919 (Seyrig 1928) which is a direct synonym of *Perosis* auctt.

Pezolochus 1850 : 103.

Type species, *Pezolochus rufipes* Foerster, 1850

Included by Foerster 1850 : 104 (Monobasic)

= *Gelis* Thunberg, 1827

= *Gelis rufipes* (Foerster, 1850)

A revisionary study of *Gelis* will very possibly show that this species belongs to a distinct segregate.

Pezoporus : 181 nec Illiger, 1811.

Type species, *Ichneumon nigrocinctus* Gravenhorst, 1815

As *Pezomachus nigrocinctus*, included and designated by Ashmead 1900b : 27 (Monobasic)

= *Aptesis* Foerster, 1868 (Townes 1944)

= *Aptesis nigrocinctus* (Gravenhorst, 1815)

Phaedroctonus : 153.

Type species, *Phaedroctonus minutus* Ashmead, 1902

Included by Ashmead 1902 : 235 (Monobasic)

= *Campoplex* Gravenhorst, 1829 (Townes 1945)

= *Campoplex cupressi* (Ashmead, 1890) (Townes 1945)

Phaenolobus : 168.

Type species, *Ichneumon arator* Rossi, 1791

Included by Schmiedeknecht 1888 : 425 (Four species)

Designated by Viereck 1914 : 114

= *Phaenolobus arator* (Rossi, 1791)

Phaenosemus : 160.

Type species, *Phaenosemus sitkensis* Ashmead, 1902

Included by Ashmead 1902 : 231 (Monobasic)

= *Orthocentrus* Gravenhorst, 1829 (Townes 1945)

= *Orthocentrus sitkensis* (Ashmead, 1902)

Phaestus : 212.

Type species, *Phaestus heterocerus* Thomson, 1894

Included by Thomson 1894 : 2017 (Monobasic)

= *Phaestus anomalus* (Brischke, 1871) (Teunissen 1948)

Phagesorus : 212.**Phatnacra** : 179.

Type species, *Hemiteles* (*Phatnacra*) *monterai* da Costa Lima, 1948

Included by da Costa Lima 1948 : 31 (Monobasic)

Philonygmus : 177.

Type species, *Philonygmus* [sic] *alaskensis* Ashmead, 1902

Included by Ashmead 1902 : 189 (Two species)

Designated by Viereck 1914 : 115

= *Alegina* Foerster, 1868 (Townes 1944)

= *Alegina solitarius* (Ashmead, 1902) (Cushman 1922)

Philotymma : 209.

Type species, *Ichneumon leptocerus* Gravenhorst, 1820 (By present designation)

= *Phobetes* Foerster, 1868 **syn. n.**

= *Phobetes leptocerus* (Gravenhorst, 1820)

The inclusion of *flaviceps* Cameron in ? *Philotymma* is not accepted as fixing the usage of this genus (Cameron 1906 : 131)

Phobetes : 198.

Type species, *Tryphon fuscicornis* Holmgren, [1854]

As *Phobetis* [emend. pro -es], included by Thomson 1889a : 1431 (Two species)

Designated by Viereck 1914 : 115

= *Phobetes fuscicornis* (Holmgren, [1854])

Roman 1917 synonymized *Phobetes* under *Ipoctonus* Foerster, 1868 nec Heine, 1860.

If this synonymy is followed, then *Ipoctoninus* Hincks, 1944 becomes a synonym of *Phobetes*. At present, however, I regard these genera as being distinct.

Phobocampe : 156.

Type species, *Campoplex crassiusculus* Gravenhorst, 1829

As *Phobocampa* [emend. pro -e], included by Thomson 1887 : 1121 (Many species)

Designated by Viereck 1914 : 116

= *Phobocampe crassiusculus* (Gravenhorst, 1829)

Phradis : 148.

Type species, *Thersilochus* [emend. pro *Ter*-], (*Phradis*) *brevis* Brischke, 1880

Included by Brischke 1880 : 195 (Monobasic)

= *Phradis brevis* (Brischke, 1880)

Phrudus : 196.

Type species, *Phrudus monilicornis* Bridgman, 1886

Included by Dalla Torre 1901 : 329 (Monobasic)

Phrudus Bridgman, 1886 : 361 was described as a new genus ; hence this cannot be taken as *Phrudus* Foerster, 1868. Thomson 1888 places *monilicornis* Bridgman in *Phrudus* Bridgman. The first inclusion of *monilicornis* in *Phrudus* Foerster, 1868 is by Dalla Torre.

Phthorima : 162.

Type species, *Bassus compressus* Desvignes, 1856

As *Phthorimus* [emend. pro -a], included by Thomson 1890 : 1474 (Monobasic)

= *Phthorima compressa* (Desvignes, 1856)

Phytus : 181.

Type species, *Pezomachus hemipterus* (Fabricius) ; Gravenhorst, 1829

As *Hemiteles hemipterus*, included and designated by Ashmead 1900b : 27 (Monobasic)

= *Theroscopus* Foerster, 1850 **syn. n.**

= *Theroscopus hemipterus* (Fabricius, 1793)

Townes 1944 considered this a synonym of *Eriplanus* Foerster.

Phyzelus : 185.

Type species, *Phyzelus fasciatus* Brischke, 1888

Included by Brischke 1888 : 105 (Monobasic)

= *Phyzelus flagitator* (Rossi, 1794) **syn. n.**

Picroscopus : 195.

Type species, *Tryphon ictericus* Gravenhorst, 1829

Included by Thomson 1883 : 888 (Monobasic)

= *Exenterus* Hartig, 1837 (Mason 1951)

= *Exenterus ictericus* (Gravenhorst, 1829)

Picrostigeus : 159.

Type species, *Orthocentrus (Picrostigeus) setiger* Brischke, 1871

Included by Thomson 1898 : 2432 (Three species)

Designated by Viereck 1912a : 176

= *Picrostigeus setiger* (Brischke, 1871)

Plesignathus : 183.

Type species, *Phygadeuon fulvescens* Cresson, 1878

As *Plesiognathus* [lapsus pro *Plesign-*] *flavescens* [lapsus pro *fulv-*], included by Ashmead in Smith 1900a : 568 (Monobasic)

= *Polytribax* Foerster, 1868 **syn. n.**

= *Polytribax fulvescens* (Cresson, 1878)

Smith's *Insects of New Jersey* has the preface dated March 1900; Ashmead's paper in *Proc. U.S. nat. Mus.* **23** : 29, where the type of *Plesignathus* is given as *Phygadeuon cephalotes* Gravenhorst was published on 13th October. I have therefore, taken it as probable that Smith's book appeared earlier than the Ashmead paper.

Plesiomma : 176 nec Macquart, 1838.

Plesiophthalmus : 170 nec Motschoulsky, [1858].

Type species, *Mesochorus alarius* Gravenhorst, 1829

Included by Brischke 1880 : 183 (Monobasic)

syn. *Mater* Schulz 1911, *Ophthalmochorus* Roman, 1925 (n.n.)

= *Cidaphus* Foerster, 1868 (Viereck 1911)

= *Cidaphus alarius* (Gravenhorst, 1829)

Polyaulon : 171.

Type species, *Polyaulon incertus* Foerster, 1871

Included by Foerster 1871 : 100 (Many species)

Designated by Viereck 1914 : 120

Thaumatotypidea Viereck, 1912 is probably based on the female of *Polyaulon*.

Polycinetis : 198.

Type species, *Notopygus resplendens* Holmgren, [1855]

Included by Woldstedt 1877 : 458 (Monobasic)

= *Xenoschesis (Polycinetis)* Foerster (Townes 1945)

= *Xenoschesis (Polycinetis) resplendens* (Holmgren, [1855])

***Polyclistus* : 161.**

Type species, *Ichneumon femoralis* Fourcroy, 1762

Included by Thomson 1887a : 218 (Three species)

Designated by Viereck 1912a : 176

= *Hypsicera* Latreille, 1829 (Viereck 1912)

= *Hypsicera femoralis* (Fourcroy, 1762)

***Polyoncus* : 197.**

Type species, *Tryphon erythrocephalus* Gravenhorst, 1829

Included by Thomson 1883 : 913 (Three species)

Designated by Viereck 1914 : 120

= *Perilissus* Holmgren, [1855] (Townes 1945)

= *Perilissus erythrocephalus* (Gravenhorst, 1829)

***Polypystis* : 208.**

Type species, *Tryphon lateralis* Gravenhorst, 1829

Included by Roman 1909 : 315 (Two species)

Designated by Viereck 1914 : 121

= *Polypystis lateralis* (Gravenhorst, 1829)

***Polyrhembia* : 189.**

Type species, *Hemiteles tenebricosus* Gravenhorst, 1829

Included and designated by Foerster 1876 : 43 (Many species)

= *Stilpnus* Gravenhorst, 1829 (Townes 1944)

= *Stilpnus tenebricosus* (Gravenhorst, 1829)

***Polyrhysia* : 204.**

Type species, *Tryphon tenuicornis* Gravenhorst, 1829

As *Polyrhysius* [emend. pro -ia], included by Thomson 1894 : 1999 (Two species)

Designated by Viereck 1914 : 121

= *Synoecetes* Foerster, 1868 (Townes & Townes 1949)

= *Synoecetes tenuicornis* (Gravenhorst, 1829)

***Polyterus* : 209.**

Type species, *Polyterus franconiaensis* Davis, 1898

Included by Davis 1898 : 289 (Two species)

Designated by Viereck 1914 : 121

***Polytrera* : 202.**

Type species, *Mesoleius* (*Barytarbus* [emend. pro -es]) *laeviusculus* Thomson, 1883

As *Mesoleius* (*Polytreres* [emend. pro -a]), included by Thomson 1892a : 1873 (Two species)

Designated by Viereck 1914 : 121

= *Barytarbes* Foerster, 1868 **syn. n.**

= *Barytarbes laeviusculus* (Thomson, 1883)

***Polytribax* : 183.**

Type species, *Phygadeuon* (*Polytribax*) *pallescens* Viereck, 1911

Included by Viereck 1911 : 406 (Monobasic)

= *Polytribax pallescens* (Viereck, 1911)

Probles : 147.

Type species, *Probles melanarius* Szépligeti, 1899
Included by Szépligeti 1899 : 219, 236 (Monobasic)

Procinetus : 167.

Type species, *Lissonota decimator* Gravenhorst, 1829
Included by Schmiedeknecht 1888 : 423 (Monobasic)
=*Procinetus decimator* (Gravenhorst, 1829)

Proclitus : 172.

Type species, *Proclitus grandis* Foerster, 1871
Included by Foerster 1871 : 116 (Many species)
Designated by Viereck 1914 : 123
=*Proclitus praetor* (Haliday, 1839) (Morley 1915)

Proedruss : 147.

Type species, *Hemiteles luteolator* Gravenhorst, 1829
Included by Thomson 1889 : 1360 (Monobasic)
=*Orthopelma* Taschenberg, 1865
=*Orthopelma mediator* (Thunberg, 1822) (Roman 1912)

Promethes : 162.

Type species, *Bassus sulcator* Gravenhorst, 1829
Included by Woldstedt 1877 : 441 (Monobasic)
=*Promethes sulcator* (Gravenhorst, 1829)

Prosmorus : 198.

Type species, *Notopygus resplendens* Holmgren, [1855]
Included by Thomson 1895 : 1983 (Monobasic)
=*Xenoschesis* (*Polycinetis*) Foerster, 1868 (Schmiedeknecht 1913)
=*Xenoschesis* (*Polycinetis*) *resplendens* (Holmgren, [1855])

Protarchus : 201.

Type species, *Tryphon rufus* Gravenhorst, 1829
Included by Woldstedt 1877 : 460 (Monobasic)
=*Protarchus testatorius* (Thunberg, 1822) (Roman 1912)

Psilosage : 203.

Type species, *Tryphon ephippium* Holmgren, [1855]
As *Tryphon* (*Psilosarge* [sic]) *ephippium*, included by Morley 1911 : 178 (Monobasic)
=*Psilosage ephippium* (Holmgren) [1955]

Townes & Townes 1950 regard this as a synonym of *Tryphon* (*Tryphon*) Fallén, 1813.

Pterocormus 1850 : 71 n.n. for *Brachypterus* Gravenhorst, 1829 nec Kugelann, 1794.
Type species, *Ichneumon* (*Brachypterus*) *means* Gravenhorst, 1829
=*Ichneumon latrator* (Fabricius, 1781)

Since *Pterocormus* was a new name for *Brachypterus*, it must have the same type species as the monobasic genus *Brachypterus*.

Rhadina : 170 nec Billberg, 1828.

Type species, *Xylonomus ater* Gravenhorst, 1829

Included and designated by Schmiedeknecht 1888 : 443 (Monobasic)

syn. *Rhadinopimpla* Schulz, 1911 (n.n.)

= *Xorides* Latreille, 1809 (Rohwer 1920)

= *Xorides ater* (Gravenhorst, 1829)

Rhadinocera : 177.

Type species, *Hemiteles (Rhadinocera) algonquinus* Viereck, 1917

Included by Viereck 1917 : 340 (Monobasic)

= *Acrolyta* Foerster, 1868 (Townes 1944)

= *Acrolyta nigricapitata* (Cook & Davis, 1891) (Townes 1944)

Rhadiurgus : 177 nec Loew, 1849.

Type species, *Hemiteles bicolorinus* Gravenhorst, 1829

As *Hemiteles (Rhadiurgus) bicolorinus*, included by Uchida, June 1933 : 153, 158
(Monobasic)

= *Gelis* Thunberg, 1827 (s.l.) **syn. n.**

= *Gelis cinctus* (Linnaeus, 1758) (Roman 1932) **comb. n.**

I included this in *Gelis* in the wide sense, much as used by Townes. *Gelis* is distinguished in this case by the long mandible which has the anterior and posterior margins rounded and the base sharply and deeply impressed, and also having the transverse groove of the pronotum uninterrupted centrally. No doubt this broad group will later be divided into a number of segregates.

Rhaestes : 198.

Type species, *Grypocentrus rufipes* Holmgren, [1855]

As *Rhaestus* [emend. pro -es], included by Thomson 1883 : 924 (Monobasic)

= *Rhaestes rufipes* (Holmgren, [1855])

Rhembobius : 184.

Type species, *Phygadeuon quadrispinus* Gravenhorst, 1829

As *quadrispinosus*, included and designated by Ashmead 1906b : 30 (Monobasic)

= *Rhembobius quadrispinus* (Gravenhorst, 1829)

Rhexidermus : 192.

Type species, *Rhexidermus japonicus* Ashmead, 1906

Included by Ashmead 1906 : 171 (Monobasic)

Rhexineura : 156.

Rhigelus : 208.

Type species, *Trematopygus krieckbaumeri* Thomson, 1895 (By present designation)

= *Trematopygus* Holmgren, [1855] **syn. n.**

= *Trematopygus melanocerus* (Gravenhorst, 1829) (Roman 1925)

Rhimphalea : 202 nec Lederer, 1863.

Type species, *Rhimphalea brevicorpa* Davis, 1897

Included by Davis 1897 : 274 (Monobasic)

= *Exetastes* Gravenhorst, 1829 (Cushman 1937)

= *Exetastes bioculatus* Cresson, 1872 (Cushman 1937)

Rhimphoctona : 153.

Type species, *Pyracmon fulvipes* Holmgren, [1858]

Included by Woldstedt 1877 : 437 (Monobasic)

= *Pyracmon* Holmgren, [1858] (Szépligeti 1911)

= *Pyracmon grandis* (Boyer de Fonscoulombe, 1852) **comb. nov.**

syn. *Rhimphoctona grandis* (Boyer de Fonscoulombe) Seyrig, 1932

Tschek 1871 : 63 gives a description of a female *Pyracmon* that he believed to be that of *P. fulvipes*, described from the male. He concluded by saying that this female can hardly be other than belonging to Foerster's genus *Rhimphoctona*; further, if the female was distinct then he proposed the name *Rhimphoctona rufipes* for it. This is not a definite placement of *fulvipes* in *Rhimphoctona*, and his own name *rufipes* is invalid.

Rhinotorus : 211.

Type species, *Spudaea longicornis* Schmiedeknecht, 1914 (By present designation)

syn. *Spudaea* Foerster, 1868 nec Snellen, 1867, *Prospudaea* Hincks, 1944 (n.n.)

syn. nov.

= *Rhinotorus longicornis* (Schmiedeknecht, 1914) **comb. n.**

Rhorus : 195.

Type species, *Tryphon mesoxanthus* Gravenhorst, 1829

Included by Woldstedt 1877 : 455 (Monobasic)

= *Rhorus mesoxanthus* (Gravenhorst, 1829)

Rhythmonotus : 151. (In the index, p. 220, given as *Rhytm-*)

Type species, *Rhythmonotus* [emend. pro *Rhyth-*] *singularis* Schmiedeknecht, 1909

Included by Schmiedeknecht 1909 : 1617 (Monobasic)

= *Casinaria* Holmgren, [1858] (Meyer 1935)

= *Casinaria singularis* (Schmiedeknecht, 1909)

Ashmead in Smith 1900a quotes *R. bilineatus* Ashmead; this, however, is a nomen nudum.

Saotis : 210.

Type species, *Mesoleius* (*Saotus* [emend. pro *-is*]) *brevispina* Thomson, 1883

Included by Thomson 1883 : 934 (Five species)

Designated by Viereck 1914 : 130

= *Saotis brevispina* (Thomson, 1883)

Sarcorychus : 212.

Type species, *Tryphon notatus* Gravenhorst, 1829 (By present designation)

= *Synodites* Foerster, 1868 **syn. n.**

= *Synodites notatus* (Gravenhorst, 1829)

Roman 1936 regarded *Synodites* as inseparable from *Syndipnus* Foerster, 1868, but this section of the Euryproctini requires much further study.

***Sathropterus* : 147.**

Type species, *Thersilochus* [emend. pro *Ter-*] *pumilus* Holmgren, [1858]

Included by Szépligeti 1905 : 55 (Monobasic)

= *Sathropterus pumilus* (Holmgren, [1858])

***Schenkia* : 184.**

Type species, *Cryptus graminicola* Gravenhorst, 1829

Included and designated by Ashmead 1900b : 30 (Monobasic)

= *Schenkia graminicola* (Gravenhorst, 1829) (syn. *Cryptus brevicornis* Gravenhorst, 1829 according to first revisor)

***Schizopoma* : 145 n.n. for *Schizoloma* Wesmael, 1849.**

Type species, *Ichneumon amictus* Fabricius, 1775

= *Schizoloma* Wesmael, 1849

= *Schizoloma amicta* (Fabricius, 1775)

***Scinacopus* : 185.**

Type species, *Phygadeuon cnemargus* Gravenhorst, 1829

Included by Brischke 1891 : 69 (Monobasic)

= *Endasys* Foerster, 1868 (Habermehl 1912)

= *Endasys parviventris* var. *cnemargus* (Gravenhorst, 1829)

***Scoparches* : 211.**

Type species, *Tryphon bicolor* Gravenhorst, 1829 (By present designation)

= *Scopesis* Foerster, 1868 **syn. n.**

= *Scopesis bicolor* (Gravenhorst, 1829)

***Scopesis* : 209.**

Type species, *Mesoleius guttiger* Holmgren, [1855]

As *Scopesus* [emend. pro *-is*], included by Thomson 1894a : 2030 (Many species)

Designated by Viereck 1914 : 132

= *Scopesis bicolor* (Gravenhorst, 1829)

***Scopiorus* : 196.**

Type species, *Polyblastus marginatus* Holmgren, [1855]

Included by Thomson 1883 : 903 (Four species)

Designated by Viereck 1914 : 132

= *Ctenochira* Foerster, 1855 (Townes & Townes 1949)

= *Ctenochira arcuatus* var. *marginatus* (Holmgren, [1855]) (Schmiedeknecht 1912)

***Semnophrys* : 158.**

Type species, *Exetastes notatus* Holmgren, [1858] (By present designation) (From description)

= *Exetastes* Gravenhorst 1829 **syn. n.**

Schmiedeknecht 1910 : 1879 included this as a doubtful synonym of *Rhynchobanchus* Kriechbaumer, 1894.

Sichelia : 169.

Type species, *Xylonomus filiformis* Gravenhorst, 1829

Included by Schmiedeknecht 1888 : 443 (Monobasic)

Designated by Viereck 1914 : 133

=*Xorides* Latreille, 1809 (Rohwer 1920)

=*Xorides filiformis* (Gravenhorst, 1829)

Sinophorus : 153.

Type species, *Limneria* (*Sinophorus*) *canarsiae* Ashmead, 1898

Included by Ashmead 1898 : 126 (Monobasic)

=*Campoplex* Gravenhorst, 1829 (Viereck 1921)

=*Campoplex validus* (Cresson, 1864)

Sobas : 187 nec Pascoe, 1863.

Type species, *Cryptus cinctorius* (Fabricius) ; Gravenhorst, 1829

Included and designated by Schmiedeknecht 1890 : 113 (Monobasic)

=*Apsilops* Foerster, 1868 (Townes 1944)

=*Apsilops cinctorius* (Fabricius, 1775)

Spanotecnus : 197.

Type species, *Ichneumon filicornis* Gravenhorst, 1820

Included by Thomson 1883 : 911 (Four species)

Designated by Viereck 1914 : 135

=*Perilissus* Holmgren, [1855]

=*Perilissus filicornis* (Gravenhorst, 1820)

Spinolia : 173 nec Dahlbom, 1854.

Type species, *Hemiteles maculipennis* Gravenhorst, 1829

Included by Schmiedeknecht 1897 : 104 (Monobasic)

=*Chirotica* Foerster, 1868 **syn. n.** (syn. *Deuterospinolia* Dalla Torre, 1902 (n.n.))

=*Chirotica maculipennis* (Gravenhorst, 1829) **comb. n.**

Spudaea : 211 nec Snellen, 1867.

Type species, *Tryphon leucostomus* Gravenhorst, 1829

As *Mesoleius* (*Spudaeus* [emend. pro -a]) *leucostomus*, included by Thomson 1883 : 932 (Three species)

Designated by Viereck 1914 : 136

=*Rhinotorus* Foerster, 1868 **syn. n.** (syn. *Prospudaea* Hincks, 1944 (n.n.))

=*Rhinotorus leucostomus* (Gravenhorst, 1829) **comb. n.**

Spudastica : 155.

Type species, *Spudastica petiolaris* Thomson, 1887

Included by Thomson 1887 : 1123 (Monobasic)

=*Spudastica kriechebaumeri* (Bridgman, 1882)

Szépligeti 1911 placed this species as a synonym of *Limneria rostralis* Brischke, 1880, but the original description disagrees radically with this interpretation.

Steganops : 175.

Type species, *Cryptus claviger* Taschenberg, 1865

Included and designated by Viereck 1914 : 136 (Monobasic)

= *Bathythrix* Foerster, 1868 (Townes 1944)

= *Bathythrix claviger* (Taschenberg, 1865)

Steganops was given as a synonym of *Leptocryptus* Thomson by Roman 1909 : 236 but with no included species.

Stenomacrus : 160.

Type species, *Orthocentrus silvaticus* Holmgren, [1856]

As a synonym of *S. femoralis* (Holmgren), included by Thomson 1898 : 2445 (Many species)

Designated by Viereck 1912a : 177.

= *Stenomacrus femoralis* (Holmgren, [1856])

Stenoschema : 220.

This name is a nomen nudum, occurring only in the index where Foerster states that it belongs to the Phygadeuontoidae.

Sterotrichus : 169.

Type species, *Xylonomus pilicornis* Gravenhorst, 1829

Included by Brischke 1880 : 127 (Monobasic)

= *Xorides* Latreille, 1809 (Rohwer 1920)

= *Xorides fuligator* (Thunberg, 1822) (Roman 1912)

Stibeutes 1850 : 76.

Type species, *Stibeutes gravenhorstii* Foerster, 1850

Included by Foerster 1850 : 77 (Three species)

Designated by Ashmead 1900b : 27

= *Phygadeuon* Gravenhorst, 1829 (Thomson 1884)

= *Phygadeuon gravenhorstii* (Foerster, 1850)

Stiboscopus : 182.

Type species, *Stiboscopus thoracicus* Ashmead, 1900

Included by Ashmead 1900 : 267 (Two species)

Designated by Viereck 1911a : 193

Stilbops : 163.

Type species, *Pimpla vetula* Gravenhorst, 1829

Included by Schmiedeknecht 1888a : 530 (Two species)

As *veluta*, designated by Ashmead 1900b : 55

= *Stilbops vetula* (Gravenhorst, 1829)

Stiphrosomus : 198 nec Fieber, 1858.

Type species, *Mesoleptus fuscicornis* (Gmelin) ; Gravenhorst, 1829

Included by Thomson 1895 : 1973 (Six species and one synonym)

Designated by Viereck 1914 : 139

= *Trapezocora* Foerster, 1868 **syn. n.** (syn. *Eustiphrosomus* Hincks, 1944 (n.n.))

= *Trapezocora fuscicornis* (Gmelin, 1790) **comb. n.**

Townes 1945 synonymized this segregate with *Pion* Schiødte, 1838.

***Strepsimallus* : 176.**

Type species, *Strepsimallus bicinctus* Ashmead, 1905

Included by Ashmead 1905a : 115 (Monobasic)

***Stygera* : 176.**

Type species, *Stygera rufipes* Perkins 1962

= *Cremnodes* Foerster, 1850 **syn. n.** (syn. *Caenomeris* Foerster, 1868) **syn. n.**

= *Cremnodes rufipes* (Perkins 1962) **comb. n.**

If *Caenomeris* is considered distinct from *Cremnodes*, then *Stygera* is considered a synonym of *Caenomeris*.

***Sychnoleter* : 197.**

Type species, *Mesoleptus geniculosus* Gravenhorst, 1829

Included and designated by Thomson 1889a : 1430 (Monobasic)

= *Sychnoleter geniculosus* (Gravenhorst, 1829)

***Synchoportus* : 208. (In the index, p. 220, given as *Sychnoporthus*)**

Type species, *Synchoportus rufopectus* Ashmead, 1898

Included by Ashmead 1898a : 169 (Monobasic)

= *Polyterus* Foerster, 1868 (Townes 1945)

= *Polyterus olympiae* (Ashmead, 1896) (Townes 1945)

***Symboethus* : 204.**

Type species, *Tryphon exclamationis* Gravenhorst, 1829

As *Tryphon* (*Symboethus*), included by Morley 1911 : 178 (Two species)

Designated by Viereck 1914 : 140

= *Tryphon* (*Symboethus*) Foerster, 1868 (Morley 1911)

= *Tryphon* (*Symboethus*) *exclamationis* (Gravenhorst, 1829)

***Sympherta* : 196.**

Type species, *Tryphon burrus* Cresson, 1868

Included by Davis 1897 : 252 (Monobasic)

= *Pion* Schiødte, 1838 (Townes 1945)

= *Pion burrus* (Cresson, 1868)

Viereck 1914 : 140 gives "Two species", but the second is included as *Sympherta* ? and is therefore not available for type selection.

The status of the genera placed under *Pion* in the North American Catalogues requires reinvestigation.

***Symphobus* : 199.**

Type species, *Tryphon pleuralis* Cresson, 1864

Included by Davis 1898 : 323 (Monobasic)

= *Perilissus* Holmgren, [1855] (Townes 1945, Burks 1952)

= *Perilissus pleuralis* (Cresson, 1864)

Perilissus may well be divided into a number of segregates. Townes 1939 placed *Symphobus* as a synonym of *Oetophorus* Foerster, 1868.

Symphylus 1871 : 105 nec Dallas, 1851.

Type species, *Symphylus hadrodactylus* Foerster, 1871

Included and designated by Foerster 1871 : 105 (Two species)

= *Acrodactyla* Haliday, 1839 (Morley 1908) (syn. *Polemophthorus* Schulz 1911 (n.n.))

= *Acrodactyla degener* Haliday, 1839 **syn. n.**

Symplecis : 151.

Type species, *Symplecis alpicola* Foerster, 1871

Included by Foerster 1871 : 119 (Three species)

Designated by Viereck 1914 : 140

Sympratis : 146.

Type species, *Anomalon ferrugineus* Norton, 1863

As *Erigorgus* (*Sympratis*), included by Viereck 1917 : 285 (Monobasic)

= *Erigorgus* Foerster, 1868 (Townes 1945)

= *Erigorgus ferrugineus* (Norton, 1863)

Synaema : 201.

Type species, *Adelognathus brevicornis* Holmgren, [1855]

As *Syenenema* [lapsus pro *Synaema*], a synonym of *Adelognathus*, included by Szépliget 1911 : 50 (Many species)

Designated by Viereck 1914 : 141

= *Adelognathus* Holmgren, [1855] (Szépliget 1911)

Synagrypnus : 203.

Type species, *Synagrypnus blancoburgensis* Schmiedeknecht, 1914

Included by Schmiedeknecht 1914 : 2806 (Monobasic)

Meyer 1936 has synonymized this genus with *Hodostates* Foerster, 1868.

Syndipnus : 209.

Type species, *Euryproctus* (*Syndipnus*) *macrocerus* Thomson, 1883

Included by Thomson 1883 : 928 (Many species)

Designated by Viereck 1914 : 141

= *Syndipnus macrocerus* (Thomson, 1883)

Syneches : 173 nec Walker, 1852.

Type species, *Hemiteles* ? *thyridopteryx* Riley 1869

As *thyridopterigis*, included by Ashmead in Smith 1900a : 569

= *Hymenosyneches* Viereck, 1912 (n.n.)

= *Hymenosyneches thyridopteryx* (Riley, 1869)

Townes 1944 regards this as being congeneric with *Diaglypta* Foerster (= *Phobetres* Foerster Townes nec Foerster).

Synetaeris : 155.

Type species, *Synetaeris heteropus* Thomson, 1887

Included by Thomson 1887 : 1115 (Three species)

Designated by Viereck 1914 : 141

Habermehl 1922 has synonymized this species with *S. carbonella* Thomson, 1887 but this requires confirmation.

Synodites : 211.

Type species, *Tryphon assimilis* Holmgren, [1856]

As *Synodytes* [emend. pro -dites], included by Thomson 1894 : 2002 (Five species)

Designated by Viereck 1914 : 141

= *Synodites notatus* (Gravenhorst, 1829) (Pfankuch 1907)

Brischke 1892 : 37 quotes *Perilissus nigropunctatus* Brischke as possibly belonging to this genus [as *Synoditis lapsus* pro -tes].

Synoecetes : 203.

Type species, *Mesoleptus sedulus* Cresson, 1868

Included by Davis 1897 : 279 (Three species)

Designated by Viereck 1914 : 142

= *Synoecetes festinus* (Cresson, 1864) (Townes 1945)

Synomelix : 206.

Type species, *Synomelix sieboldii* Kriechbaumer, 1897

Included by Kriechbaumer 1897a : 188 (Monobasic)

= *Synomelix albipes* (Gravenhorst, 1829) (Schmiedeknecht 1913)

Synoplus : 159.

Type species, *Synoplus brevipennis* Ashmead, 1902

Included by Ashmead 1902 : 226 (Two species)

Designated by Viereck 1914 : 142

= *Stenomacrus* Foerster, 1868 (Townes 1945)

= *Stenomacrus brevipennis* (Ashmead, 1902)

Syntactus : 210.

Type species, *Ichneumon delusor* Linnaeus, 1758 (By present designation)

syn. *Brischkea* Kriechbaumer, 1897 **syn. n.**

= *Syntactus delusor* (Linnaeus, 1758) **comb. n.**

Syrphoctonus : 162.

Type species, *Bassus biguttatus* Gravenhorst, 1829

Included by Woldstedt 1877 : 441 (Four species)

Designated by Viereck 1914 : 142

= *Syrphoctonus biguttatus* (Gravenhorst, 1829)

Syzeuctus : 167.

Type species, *Ichneumon maculatorius* Fabricius, 1787

Included and designated by Schmiedeknecht 1888 : 439 (Monobasic)

= *Syzeuctus maculatorius* (Fabricius, 1787)

Tachyporthus : 210.

Type species, *Scolobates italicus* Gravenhorst, 1829

Included by Kriechbaumer 1901 : 95 (Monobasic)

= *Aeolometis* Foerster, 1868 (Viereck 1914)

= *Aeolometis italicus* (Gravenhorst, 1829)

Tapinops : 160.

Type species, *Orthocentrus californicus* Ashmead, 1890

Included by Ashmead 1896a : 204 (Monobasic)

=*Orthocentrus* Gravenhorst, 1829 (Townes 1945)

=*Orthocentrus pusillus* (Walsh, 1873)

Tautozelus : 212.

Type species, *Euceros egregius* Holmgren, [1855] (By present designation)

=*Euceros* Gravenhorst, 1829 **syn. n.**

=*Euceros serricornis* Haliday, 1839 (Morley 1911)

Teleutaea : 164.

Type species, *Glypta striata* Gravenhorst, 1829

Included by Schmiedeknecht 1888 : 431 (Monobasic)

=*Teleutaea striata* (Gravenhorst, 1829)

Temelucha : 148.

Type species, *Porizon macer* Cresson, 1872 (By present designation)

Included by Ashmead in Smith 1900a : 584 (Four species and one nomen nudum)

=*Temelucha facilis* (Cresson, 1872) (Cushman 1917 as *Cremastus*)

This reference to Ashmead 1900 seems to have been overlooked previously in considering the type species of *Temelucha*. The above selection of type should retain *Temelucha* in its recent usage.

Terozoa : 200.

Type species, *Terozoa quadridens* Perkins, 1962

Terpiphora : 185.

Type species, *Alegina alaskensis* Ashmead, 1902

Included and designated by Viereck 1914 : 144 (Monobasic)

=*Alegina* Foerster, 1868 (Townes 1944)

=*Alegina solitarius* (Ashmead, 1902) (Cushman 1922 as *Bathymetis*)

Roman 1909 : 243 tentatively places in this genus *Phygadeuon liogaster* Thomson ; he states that this species " would " be divided between *Alegina* and *Terpiphora* in Foerster's system.

Thaumatotypus : 172.

Type species, *Thaumatotypus femoralis* Brischke, 1881

Included by Brischke 1881 : 349 (Monobasic)

=*Gelis* Thunberg, 1827 **syn. n.**

=*Gelis femoralis* (Brischke, 1881) (syn. *Pezomachus myrmecinus* Thomson, 1884)

If *Gelis* is divided into different genera, then *Thaumatogelis* Schmiedeknecht, 1933 is a synonym of *Thaumatotypus*.

Theroscopus 1850 : 92.

Type species, *Pezomachus pedestris* (Fabricius) ; Gravenhorst, 1829

Included by Foerster 1850 : 102 (Many species)

Designated by Viereck 1914 : 145

=*Theroscopus pedestris* (Fabricius, 1775)

This species most probably belongs to the same segregate as *Hemiteles hemipterus* (Fabricius, 1793). If this is followed, then *Chamerpes* and *Phyrtus* become synonyms of *Theroscopus*. Townes regards the two latter genera as synonyms of *Eriplanus*, but this seems to me to be a dubious placement.

Thymaris : 151.

Type species, *Thymaris pulchricornis* Brischke, 1880

Included by Brischke 1880 : 145 (Monobasic)

= *Thymaris tener* (Gravenhorst, 1829) (syn. *Mesoleptus tener* Gravenhorst, 1829, *Hemiteles contaminatus* Gravenhorst, 1829 (Pfankuch 1906 and 1925))

Pfankuch synonymized the above two species of Gravenhorst with *Thymaris pulchricornis* Brischke. However, no priority was established between the two names and page priority has been followed.

Thysiotorus : 181.

See notes on Brischke species, p. 392

Type species, *Hemiteles* (*Physiotorus* [sic]) *brevipennis* Brischke, 1891

Included by Brischke 1891 : 71 (Two species)

Designated by Viereck 1914 : 145

= *Theroscopus* Foerster, 1850 **syn. n.**

= *Theroscopus hemipterus* (Fabricius, 1793)

Tlemon : 209.

Type species, *Tlemon delicatus* Ashmead, 1902

Included by Ashmead 1902 : 216 (Monobasic)

= *Syndipnus* Foerster, 1868 (Townes 1945)

= *Syndipnus delicatus* (Ashmead, 1902)

Tolmerus : 177 nec Loew, 1849.

Tranosema : 157.

Type species, *Tranosema arenicola* Thomson, 1887

Included by Thomson 1887 : 1138 (Three species)

Designated by Viereck 1914 : 147

Morley 1915 has synonymized this species with *Limneria robusta* Woldstedt, 1876, but there is no justification for this synonymy.

Szépligeti 1911 has synonymized *Tranosema* Foerster Thomson with *Gonotypus* Foerster, 1868. This however, is not based on type species.

Trapezocora : 208.

Type species, *Mesoleptus antilope* Gravenhorst, 1829 (By present designation)

syn. *Atrestes* Foerster, 1868, *Campogenes* Foerster, 1868, *Stiphrosomus* Foerster, 1868 nec Fieber, 1858, *Eustiphrosomus* Hincks, 1944 **syn. n.**

= *Trapezocora antilope* (Gravenhorst, 1829) **comb. n.**

Trestis : 174.

Type species, *Thestis* [sic] *tricincta* Ashmead, 1902

Included by Ashmead 1902 : 187 (Monobasic)

= *Eusterinx* Foerster, 1868 (Townes 1945)

= *Eusterinx trifasciata* (Ashmead, 1899) (Townes 1945)

Tricamptus : 194.

Type species, *Exenterus pratorum* Woldstedt, 1872

Included by Woldstedt 1877 : 454 (Monobasic)

=*Exyston* Schiødte, 1839 (Mason 1951)

=*Exyston pratorum* (Woldstedt, 1872)

Trichocalymma : 196.

Type species, *Trichocalymma bipunctatum* Woldstedt, 1877

Included by Woldstedt 1877 : 457 (Three species)

Designated by Viereck 1914 : 148

=*Erromenus* Holmgren, [1855] (cf. Schmiedeknecht 1912)

=*Erromenus bipunctatus* (Woldstedt, 1877)

Hellén 1944 states that this is a variety of *E. analis* Brischke, 1871.

Tricholinum : 183.

Type species, *Stiboscopellus pimploides* Roman, 1930

=*Tricholinum pimploides* (Roman, 1930) **comb. n.**

Stiboscopellus Roman, 1930 is therefore a synonym of *Tricholinum* Foerster, **syn. n.**

Triclistus : 161.

Type species, *Exochus podagricus* Gravenhorst, 1829

Included by Holmgren 1873 : 58 (Many species)

Designated by Morley 1913 : 300

=*Triclistus podagricus* (Gravenhorst, 1829)

Trisacra : 174.

Type species, *Hemiteles apertus* Thomson, 1884

Roman 1925 : 14 gives *Trisacra* as a synonym of *Gnyptetomorpha*, the included species are therefore the same as for *Gnyptetomorpha*.

Designated by Townes 1944 : 210

=*Gnyptetomorpha* Foerster, 1868 (Roman 1925)

=*Gnyptetomorpha aperta* (Thomson, 1884)

Tromatobia : 164.

Type species, *Pimpla variabilis* Holmgren, [1854]

Included by Schmiedeknecht 1888a : 448

Designated by Ashmead 1900b : 57

=*Tromatobia variabilis* (Holmgren, [1854])

In Schmiedeknecht's key to genera (1888 : 448) two species are mentioned, later (p. 496) he reproduces Foerster's manuscript key to *Tromatobia* and this contains ten species.

Tromera : 164.

Type species, *Pimpla pomorum* Ratzeburg, 1848

Included and designated by Schmiedeknecht 1888a : 448 (Monobasic)

=*Scambus* Hartig, 1838 (Townes 1944)

=*Scambus pomorum* (Ratzeburg, 1848)

***Tromopoea* : 210.**

Type species, *Catoglyptus minor* Holmgren, [1855] (By present designation)

=*Syntactus* Foerster, 1868 (line priority) **syn. n.**

=*Syntactus minor* (Holmgren, [1855]) **comb. n.**



FIG. 4. *Tricholinum pimploides* (Roman) ♀.

***Trophoctonus* : 206.**

Type species, *Tryphon xanthostomus* Gravenhorst, 1829

Included by Thomson 1894 : 1999-2000 (Two species)

Designated by Viereck 1914 : 150

=*Pantorhaestes* Foerster, 1868 (Pfankuch 1906 : 83)

=*Pantorhaestes xanthostomus* (Gravenhorst, 1829)

***Trychosis* : 187.**

Type species, *Cryptus titillator* (Linnaeus) ; Gravenhorst, 1829

Included and designated by Schmiedeknecht 1890 : 114 (Many species)

=*Trychosis ambigua* (Tschek, 1870) (sec Schmiedeknecht 1904)

The type selection by Schmiedeknecht antedates that by Viereck 1914 : 151.

Thomson 1874 : 590 states that *Trychosis* is a synonym of *Goniocryptus* which was described with included species by Thomson 1873 : 490-494 ; in this, *Ichneumon titillator* Linnaeus is included. *Ichneumon titillator* Linnaeus is a species of *Cryptus* (syn. *C. recreator* Fabricius) (see Roman 1931).

***Trysicampe* : 207.**

Type species, *Ichneumon piceator* Thunberg, 1822 (By present designation)

= *Alloplasta* Foerster, 1868 **syn. n.**

= *Alloplasta piceator* (Thunberg, 1822)



FIG. 5. *Tricholinum pimploides* (Roman) ♀.

***Tycherus* : 192.**

Type species *Phaeogenes (Proscus) elongatus* Thomson, 1891 (By present designation)

= *Phaeogenes* Wesmael, 1844 **syn. n.**

= *Phaeogenes elongatus* Thomson 1891

If *Proscus* Holmgren, 1889 is considered a distinct genus, then it falls as a synonym of *Tycherus*.

***Udenia* : 202.**

Type species, *Perilissus (Udenia) herrichii* Kriechbaumer, 1892

Included by Kriechbaumer 1892 : 40 (Monobasic)

= *Perilissus* Holmgren, [1855] (Schmiedeknecht 1912 : 2537)

= *Perilissus rufoniger* (Gravenhorst, 1820) (Roman 1914)

***Ulothymus* : 185.**

Type species, *Ichneumon perscrutator* Thunberg, 1822 (By present designation)
 = *Rhembobius* Foerster, 1868 **syn. n.**
 = *Rhembobius perscrutator* (Thunberg, 1822)

***Urithreptis* : 180.**

Foerster's specimen is a *Gelis* male, probably of the *Hemiteles rugifer* group, but at present undeterminable by me.

***Xenacis* : 167.**

Type species, *Lissonota caligata* Gravenhorst, 1829
 As *Henacis* [lapsus pro *Xen-*], included by Brischke 1880 ; 125 (Monobasic)
 = *Cryptopimpla* Taschenberg, 1863
 = *Cryptopimpla caligata* (Gravenhorst, 1829)

It should be noted that Viereck 1914 confused two completely distinct type species when he synonymized *Xenacis* under *Cylloceria*.

***Xenobrachys* : 179.**

Type species, *Hemiteles longicaudatus* Thomson, 1884 (By present designation)
 = *Dichrogaster* Doumerc, 1855 **syn. n.**
 = *Dichrogaster longicaudatus* (Thomson, 1884) **comb. n.**

Roman 1925 synonymized this species with *ruficollis* Gravenhorst, 1829, but this is highly doubtful.

***Xenodocon* 1855 : 186.**

Type species, *Xenodocon ruficornis* Foerster, 1855
 Included by Foerster 1855 : 237 (Monobasic)
 = *Acroricnus* Ratzeburg, 1852
 = *Acroricnus stylator* (Thunberg, 1822)

***Xenolytus* : 174.**

Type species, *Xenolytus rufipes* Cameron, 1906
 Included by Cameron February 1906 : 154 (Monobasic)
 syn. *Sternocryptus* Roman, 1925 **syn. n.**
 = *Xenolytus bitinctus* (Gmelin, 1790) **syn. n. comb. n.**

The reference given by Viereck 1914 is to a later paper which was read 27 June, (Cameron 1906a : 329). The paper in the Annals quoted above was received by the British Museum on 10 April, 1906.

Xenonastes* : 208.**Xenoschesis* : 158.**

Type species, *Exetastes fulvipes* Gravenhorst, 1829
 Included by Jemiller 1894 : 147 (Monobasic)
 = *Xenoschesis fulvipes* (Gravenhorst, 1829)

***Xestophyes* : 189.**

Type species, *Xestophya* [emend. pro -es] *fallax* Foerster, 1876
 Included by Foerster 1876 : 28 (Two species)
 As *Xestophya*, designated by Ashmead 1900b : 26.
 = *Xestophyes fallax* Foerster, 1876

Xylophrurus : 169.

Type species, *Echthrus lancifer* Gravenhorst, 1829,

Included by Schmiedeknecht 1888 : 442 (Monobasic)

= *Xylophrurus dispar* (Thunberg, 1822) (Roman 1912)

Zacalles : 204.

Type species, *Zacalles magnus* Davis, 1898

Included by Davis 1898 : 283 (Monobasic)

= *Protarchus* Foerster, 1868 (Cushman 1924)

= *Protarchus magnus* (Davis, 1898)

Zachresta : 151.

Type species, *Zachresta insignis* Woldstedt, 1877

Included by Woldstedt 1877 : 436 (Monobasic)

Zaglyptus : 166.

Type species, *Polysphincta varipes* Gravenhorst, 1829

Included by Woldstedt 1877 : 444 (Monobasic)

= *Zaglyptus varipes* (Gravenhorst, 1829)

Zapedias : 206.**Zaphleges** : 184.

Type species, *Phygadeuon leucostigmus* Gravenhorst, 1829

As *leucostigmus* [lapsus pro -stigmus], included by Ashmead 1900b : 30 (Monobasic)

= *Phygadeuon* Gravenhorst, 1829 (Townes 1944)

Zaphthora : 206.**Zaplethis** : 205.

Type species, *Ichneumon sulphuratus* Gravenhorst, 1807 (By present designation)

= *Perispuda* Foerster, 1868 **syn. n.**

= *Perispuda sulphurata* (Gravenhorst, 1807)

Zaporus : 152.

Type species, *Campoplex dorsalis* Gravenhorst, 1829

Included by Schmiedeknecht 1907a : 599 (Monobasic)

= *Meloboris* Holmgren, [1858] (Szépligeti 1911)

= *Meloboris dorsalis* (Gravenhorst, 1829)

Zatypota : 166.

Type species, *Ichneumon percontatoria* Mueller, 1776

Included by Schmiedeknecht 1888 : 433 (Five species)

Designated by Viereck 1914 : 156

= *Zatypota percontatoria* (Mueller, 1776)

Zemiodes : 200.

Type species, *Mesoleptus* (*Zemiodes*) *erythropus* [Foerster MS.] Kriechbaumer, 1891

(By present designation)

Included by Kriechbaumer 1891a : 140 (Two species)

= *Hadrodactylus* Foerster, 1868

= *Hadrodactylus typhae* (Fourcroy, 1785) (Kriechbaumer 1891a)

Zemiophora : 203.

Type species, *Tryphon scutulatus* Hartig, 1838

As *Syndipnus* (*Zemiophorus* [emend. pro -a]) *scutulatus*, included by Thomson 1894 : 2000 (Monobasic)

= *Zemiophora scutulata* (Hartig, 1838)

Townes 1945 synonymized *Zemiophora* under *Synomelix* Foerster, 1868. These two genera seem to me to be quite distinct.

Zemiophron : 206.

Type species, *Mesoleius laevissimus* Strobl, 1903 (syn. *Alexeter rapinator* Gravenhorst ♂ Schmiedeknecht, 1914 nec Gravenhorst ♀ 1829) (By present designation)

= *Alexeter* Foerster, 1868 **syn. n.**

= *Alexeter laevissimus* (Strobl, 1903) (**comb. n.**)

Much confusion exists over the usage of the name *rapinator* Gravenhorst. Schmiedeknecht believed that the ♂ and ♀ described by Gravenhorst belonged to different species. Heinrich 1953 determined the type ♀ of *M. laevissimus* Strobl from Schmiedeknecht's work as *rapinator* Gravenhorst, and it was this species that Foerster placed under *Zemiophron*. Until a lectotype can be selected in the Gravenhorst collection, the usage of the name *rapinator* must remain in doubt. The ♀ *rapinator* in the Gravenhorst collection is *Lagarotis semicaligatus* (Gravenhorst, 1829) (Pfankuch 1906 : 86).

Zetesima 1876 : 25.

Type species, *Zetesima rufipes* Foerster, 1876

Included and designated by Foerster 1876 : 27 (Monobasic)

Zoophthorus : 180.

Type species, *Hemiteles* (*Zoophthorus*) *nigricaniformis* Viereck, 1917

Included by Viereck 1917 : 340

= *Mastrus* Foerster, 1868 (Townes 1944)

= *Mastrus gigas* (Provancher, 1886) (Townes 1944)

Zootrepes : 162.

Type species, *Bassus* (*Zootrepes*) *hilaris* Woldstedt, 1880

Included by Woldstedt 1880 : 175 (Monobasic)

= *Zootrepes hilaris* (Woldstedt, 1880)

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